University of Alberta

Essays on Internally Generated Firm Changes

by

Gregory Harold MacKinnon ©

A thesis submitted to the Faculty of Graduate Studies and Research in partial fulfillment of the requirements for the degree of Doctor of Philosophy

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Abstract

In Chapter 2 of the thesis, a simple model is derived which shows that a Board of Directors that is acting exclusively in the interests of shareholders will not necessarily replace the Chief Executive Officer (CEO) even if they know that the incumbent CEO has a level of managerial ability that is below average with respect to the pool of potential replacements. This result is due to the fact that replacement of a manager entails the risk that the replacement may be of worse quality than the incumbent.

Chapters 3 and 4 both deal with sales of assets between firms. Both chapters look at the gains to the transaction for the selling firm as well as the buying firm. In Chapter 3, three types of gains are examined; gains to the seller, to the buyer and in total. It is found that asset sales following a takeover threat on the selling firm have smaller total gains than those unassociated with a takeover threat. Also, it is found that the largest total gains come when assets are sold by firms with loose capital constraints to firms with tighter capital constraints. Also presented is evidence consistent with poorer performance being associated with more bargaining power. This result is hypothesized to be due to poor performance acting as a form of discipline on firms.

Chapter 4 examines the effect of the use to which the proceeds of an asset sale are put. It is found that firms which sell assets and use the proceeds

to repay debt receive significantly smaller returns than those firms reinvesting the proceeds. However, the firms buying the assets do not do any better on average when the seller repays debt. The conclusion drawn is that repaying debt may be indicative of creditor pressure on the divesting firms and that this pressure results in assets being sold at inopportune times rather than having any effect on the negotiating power of the parties involved in the transaction.

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Chapter 1

Introduction

This thesis consists of three essays connected by the fact that they deal with changes to firm structure that are voluntarily made by the firm. Chapter 2 deals with changes to the management structure of the firm. More specifically, the circumstances under which the Board of Directors will replace senior management is studied. Chapters 3 and 4 deal with changes to the asset structure of the firm that are accomplished through a sale of assets to outside parties.

Chapter 2 ("Rational, Value-Maximizing Boards of Directors and Replacement of Management") consists of a simple model of the behaviour of Board of Directors when acting in the interests of shareholders. Currently, the literature is debating whether Boards of Directors monitor the actions of senior management and replace management if they are not maximizing the value of the firm. This research addresses the question of when a rational Board of Directors will replace a manager. It is shown, using a simple static model, that a Board of Directors which is rational and acting exclusively in the interests of shareholders will not always replace managers they know to be of below average ability. The model developed is based on the idea that the value of a firm is a known function of the ability of the manager as well as a random state of the world. The intuition behind the finding is that, even if the Board knows the managerial ability of the incumbent is below average, replacing the manager involves choosing a new, unknown manager from a pool of candidates. Even though the incumbent is a "bad" manager, there is always a chance that any replacement may turn out to be worse. Furthermore, searching for a manager is costly and replacing the incumbent will result in a disruption of the firm's business. The basic contention of the model is that many of the examples of the apparent ineffectiveness of Boards at unseating incumbent management may not be the result of "lame-duck" Boards nor of non-value maximizing Boards. Rather, the uncertain environment in which Boards make decisions may be responsible for the retention of below average managers.

Chapter 3 ("Dividing the Pie: How Buyers and Sellers Share the Gains to a Sale of Assets") is an empirical look at the wealth effects of corporate asset sales. Previous research has shown there to be an average shareholder wealth increase for divesting firms on announcement of an asset sale. Results on the wealth effects for firms buying divested assets is mixed, although on balance it seems that buying firms also gain on average. The research conducted in Chapter 3 of this thesis is distinguished from previous work by the fact that it looks at three types of wealth effects simultaneously: on the selling firm, the buying firm, and in total. This allows one to determine if cross-sectional variation in firm wealth effects is due to variation in the negotiating power of the parties or to variation in the overall gains to trade.

A basic event study methodology is used to measure the stock price impact of asset sales. A "matched" sample of voluntary asset sales is used in which only transactions for which both the buyer *and* the seller are known and have information available are included. This matching of buyers and sellers allows one to examine the effects of seller (buyer) characteristics on the stock price reaction of the buyer (seller). It also allows the calculation of the total equity market gains to each transaction. Two variables hypothesized to have an effect on both the negotiating position of the firms and the total gains to the transaction are studied: the existence of a takeover threat on one of the firms, and the financial condition of the two firms.

The results of the study show that both the financial characteristics of the firms and the existence of a previous takeover threat on the selling firm affect the total gains to a transaction as well as the breakdown of those gains between the parties. If the seller has recently been under the threat of takeover, the total gains to the transaction are significantly lower. This reduction in available gains, however, is entirely borne by the buying firm. Unfortunately, it is not possible to distinguish whether this is due to increased competition for the assets or due to the buyer acting as a White Knight for the threatened firm. The results on the financial characteristics of the two firms reveal that the greatest total gains come in transactions where assets are transferred from firms with loose capital constraints to firms with tighter constraints. Furthermore, it seems that better financial performance for a firm (on either side of the transaction) *lessens* the bargaining power for that firm. The effects of the financial characteristics of the firms on total available gains and on bargaining power are explained by the effect of poor performance as a disciplining device.

Chapter 4 ("Asset Sales and Creditor Pressure: Do Buyers Benefit?") looks at the variation in stock price effects from assets sales when the proceeds are used in different ways by the divesting firms. In particular, the concern is whether pressure from creditors affects firms' divestiture decisions and whether buying firms can benefit from this pressure.

Using a sample of large asset sales for which the buyer and the seller are known, an event study is conducted to determine if there exist differences in stock price reactions when the selling firm uses the proceeds to repay debt, repurchase stock, or re-invest in itself. The findings indicate that buyers have significantly negative returns when buying from firms that repurchase stock. However, this effect seems to be due to an association between the repurchase of stock and the threat of takeover on the selling firm, rather than the use of proceeds itself. For selling firms, the results show evidence that divesting firms which re-invest the proceeds of the sale do significantly better than firms which use the proceeds to pay back debt. This is consistent with the hypothesis that creditors can put pressure on firms to sell and that these pressured firms fare worse in sell-offs. However, there is no evidence that buyers in these debt reducing divestitures do any better than other buyers.

Thus, the lower seller gains do not seem to be the result of divesting firms having to sell at bargain prices. On a practical level, the results indicate that if a firm wishes to expand through the purchase of assets, there is little point in finding debt laden firms from which to buy.

Chapter 2

Rational, Value-Maximizing Boards of Directors and Replacement of Management[1]

I - Introduction

The modern form of the corporate entity has, at the peak of its hierarchical structure, the Board of Directors. In theory, the Board is responsible directly to the shareholders of the firm and its duties include appointing and evaluating the management team that is responsible for running the operations of the firm. The Board is designed to mitigate the agency costs associated with the separation of ownership and control in a world of less than perfect information. In line with this, the Board is also responsible for monitoring the actions of management and replacing the management if they are not maximizing the value of the firm. Bruce Atwater, CEO of General Mills states that "the most important function of directors is management selection, evaluation, compensation, and replacement...The Board must regularly evaluate the CEO and evaluate his or her succession plan."

There has been much debate in the literature as to whether the Board actually does fulfill this part of its mandate. Fama [1980] sees the Board as part of a system that can effectively monitor and discipline managers. The Board is, in turn, disciplined by the market for its members' services. Weisbach [1988] finds that the probability of CEO turnover is inversely related to firm performance for firms with boards that are dominated by outside directors. This would indicate that boards, at least outsider dominated ones, are responsive to problems with management. This is in line with the findings of Coughlan and Schmidt [1985] who find that Boards effectively link firm performance with manager compensation and turnover. Conversely, Mace [1971, p.182] concludes that "generally boards of directors do not do an effective job of evaluating or measuring the performance of the president." As well, whereas Jensen and Murphy [1990] find no "economically significant" link between firm performance and total manager wealth effects, Bentson [1985] finds that there is a significant effect when the change in compensation includes changes in the value of options and stock holdings for managers of large, conglomerate firms. Given that compensation is set by the Board, these results represent conflicting evidence on the effectiveness of the Board of Directors at monitoring management. Perhaps most importantly though, there is a general feeling in the popular press that Boards are not fulfilling their mandate and that "directors exist merely to ensure the smooth, uninterrupted reign of a CEO."[2]

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[1] This chapter was co-authored with Gary Smith and Jim Unterschultz.

While much of the debate has centered on the Board's role in the turnover of top management (i.e. Coughlan and Schmidt [1985], Weisbach[1988]), there is also debate as to whether Boards are serving shareholder interests when they do replace management. Jensen and Warner [1988] give a review of the literature's mixed results on the stock price reaction to management turnover announcements. Mahajan and Lummer [1993] find that internally generated changes in top management results in negative stock price reactions, whereas externally generated changes result in positive reactions. They conclude that the decision of the Board "may not be solely motivated by considerations of shareholder wealth maximization [p. 406]."

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[2] The Globe and Mail. Sept. 10, 1993. page B1

This gets to the heart of the debate about the effectiveness of the Board of Directors in replacing under-achieving managers. There seems to be some evidence (and a strong feeling in the popular press) that Boards do not replace management that is "under-achieving" in some undefined sense. Many people have taken this as evidence that the board is either not rational or is not serving the objectives of shareholders exclusively. For example, Johnson [1990, pp.47-48] states that during the 1960's and 1970's, during a period of stability and prosperity, Boards grew "fat, dumb and comfortable." Shleifer and Vishny (1988) suggest that Boards are usually predisposed to give top managers the benefit of the doubt, rather than find fault with these managers. They further state that even when a Board is value maximizing, it lacks sufficient information about the firm (and, by implication, the top manager) to maximize firm value. Shleifer and Vishny state that the Board's information limitations are likely the most important impediments to value maximizing corporate governance. Ergo, hostile takeovers pre-empt Boards as top management disciplining devices.

Evidence supporting value maximizing Boards comes from Furtado and Rozeff (1987). In this work, the managerial labour markets are examined. They find that shareholders experience small but significantly positive wealth effects with appointments to the top managerial positions. Promotion to top management is more common than external hiring and Furtado and Rozeff explain this with the existence of firm specific human capital and the higher informational costs associated with external hiring.

One problem with the previous research in the area of managerial replacement is that there exists a lack of theory to provide a firm basis for the empirical results. Further theory on the nature of the replacement decision itself is necessary to give direction to future empirical work as well as to provide a framework within which to interpret past results. Previous theory on replacement of top management by the Board of Directors is limited to three papers. Hirshleifer and Thakor [1994] model the interaction between the information sets available to the Board and to a raider in order to model how the decision to replace the CEO may change with a successful or unsuccessful takeover threat. Hermalin and Weisbach [1995] model the independence and effectiveness of Boards as endogenous to a bargaining process between the CEO and the Board. The model presented here differs from Hermalin and Weisbach in that their model assumes that Board members derive disutility from monitoring while we assume that Boards altruistically serve shareholders' interests. Finally, Parrino [1992] models the updating process on the Board's estimate of the CEO's ability and finds that management turnover should be inversely related to the noisiness of the periodic signal received by the Board. While the Parrino model is similar to this one, the key difference is that Parrino assumes that the current CEO will be replaced anytime the Board's expectation of his managerial ability is below their expectation of the ability of a potential replacement. It is this point that we address here. We show that it is not necessarily an optimal replacement rule.

In particular, this paper addresses the question of when a rational Board of Directors will replace a manager. We show that a Board of Directors which is rational and acting exclusively in the interests of shareholders will not always replace managers who are of below average ability. The intuition behind this finding is that, even if the Board knows the managerial ability of the incumbent is below average, replacing the manager involves choosing a new, unknown manager from a pool of candidates. Even though the incumbent is a "bad" manager, there is always a chance that any replacement may turn out to be worse. Furthermore, searching for a manager is costly and replacing the incumbent will result in a disruption of the firm's business. The model we present is simple in that it utilizes some well known principles of utility analysis. However, these principles are applied in an entirely new context.

Our basic premise is that many of the examples of the apparent ineffectiveness of Boards at unseating incumbent management may not be the result of "lame-duck" Boards nor of non-value maximizing Boards. Rather, it is the uncertain environment in which Boards make decisions that is responsible for the retention of below average managers.

We develop two models within this paper. The models are based on the idea that the value of a firm is a known function of the ability of the manager as well as a random state of the world. In the first model, it is assumed that the Board of Directors has perfect information regarding the ability of the incumbent manager. In the second model, this assumption is relaxed so that the Board has only imperfect information regarding the incumbent[3]. Because the basic results of the two models are the same and the intuition of our findings is more clear in the perfect information case, we leave the imperfect information model to the end and concentrate our discussion on the first model.

The paper is set up as follows. In Section II we consider the rule that a rational Board must use when deciding whether to replace management in a setting with perfect information about the incumbent manager's ability and show that some below average managers will be retained. In Section III, we explicitly examine the maximization problem considered by the Board of

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[3] We feel that presenting the two extreme cases, perfect knowledge of the incumbent versus a noisy signal of the incumbent's ability, demonstrates our results.

Directors in considering the replacement of management. In Section IV we repeat the process under the assumption that the Board has only an imperfect signal about the ability of the incumbent manager. At no point do we make assumptions about the form of the distribution of managerial talent in the economy as a whole, and assume only that the firm's value function is concave in its arguments. Section V presents some brief conclusions.

In the perfect information model (Sections II and III), it is assumed that manager ability is the only input into the firm value function. This perfect information case would correspond to the case where the Board has been able to, over time, observe various states of the world and the resulting firm value. They can therefore determine the exact ability of the incumbent manager by using the observable firm value and the known functional form of firm value. To make the derivation simpler in this case we ignore the state of the world argument in the firm value function. This assumption is reasonable given that members of the Board observe conditions in their particular industry and can filter out the effects of this random component when evaluating managers. Because the state of the world would not enter into the replacement decision process, we are justified in omitting it. It should be noted here that this omission presumes that management ability is an absolute measure and is independent of the state of the world. That is, the model does not allow a manager to be of one level of ability in one state and another level in another state (e.g. a "crisis" manager who is good at handling firms during bad times but not as good when the firm is more stable).

It should be noted at this point that what is developed here is a model of the Board's replacement decision and, as a model, it is a simplification of the real world. Our purpose is not to argue that the world must follow the model as developed here, but rather to highlight a particular insight that must be considered when interpreting empirical evidence concerning the replacement of top management by the Board of Directors.

II - Model

A. Perfect Information Model

The first case we consider is that in which the Board of Directors has perfect information about the managerial ability of the incumbent manager. We assume that all individuals are endowed with a certain level of managerial ability or talent that can be quantified by a cardinal number denoted a. Let the ability of the incumbent be denoted a_I. The assumption here is that the Board knows the ability of the incumbent exactly because they may observe the value of the firm and simply invert the functional form in order to determine a_I. The value of the firm[4] is denoted:

$$\begin{gathered} V(a_I) \\ \text{where:} \\ V'(a_I) > 0 \\ V''(a_I) < 0 \end{gathered} \qquad (1)$$

It is assumed that the value function has a lower bound of zero (i.e. the firm exhibits limited liability). The function V(.) is not adjusted for managerial compensation. Adjustments for the effect of compensation on total firm value will be made outside of the V(.) function[5]. Thus, V(.) may be thought of as a type of production function where the input is managerial ability. It is assumed that the firm is unlevered so that the value function represents the market value of equity and by maximizing V(.), the Board is explicitly serving the interests of its shareholders. The assumption of no leverage can be relaxed with little difficulty, it is made for simplicity. The effect of considering a leveraged firm will be mentioned in the conclusions to the paper. Note that the assumption of a cardinal measure of managerial ability precludes the possibility of applying a monotonic transformation to the ability measure to render the value function non-concave.

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[4] Alternatively, one can think of the V(.) function as denoting the utility of Board members. Assume that Board members' compensation (either pecuniary or in the form of increased value in the market for Board member services) is a function of firm value and firm value is, in turn some increasing function of managerial ability. As long as the Board members' utility functions are concave and there is no disutility to monitoring (i.e. Boards serve shareholders interests), then the results of the model all hold. However, we feel that taking V(.) to directly represent the value of the firm is a more intuitively appealing way in which to demonstrate the results of the model.

[5] We assume that, when there is a replacement of the CEO, the expected gains in gross firm value are divided between the firm and the new manager. Although we expect that the firm

The Board will act to maximize the value of the firm and may wish to replace the incumbent manager in order to accomplish this. If the manager is replaced, the Board randomly draws a replacement from the pool of available alternatives. Thus, while the Board recognizes the ability level of the incumbent, the ability of any potential replacement remains an unknown[6]. This assumption would seem reasonable for two reasons. Firstly, the interview and "head-hunting" process is not perfect in that it certainly does not provide a perfect signal as to the ability of a particular potential manager. Secondly, signals of managerial ability taken from past performance are also very noisy because of the inherent differences between

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will get most of the gains because of competition on the supply side of the market for managers (i.e. the firm is effectively a monopsonist), this is not necessary. As long as the firm has some expected net gain when a CEO is replaced with a new manager of greater ability, then the results of the model hold. If this was not so (managers bargained to have all of the quasi-rent created by their ability accrue to them), then replacement of management would never be observed empirically.

[6] We recognize that candidates may attempt to signal their ability. For simplicity we assume that the cost of signaling is the same for all potential replacements, regardless of their ability; therefore, the signals are viewed by the Board as being meaningless. [Spence, 1973]

organizations. A manager who has been observed to be a good manager in one firm would not necessarily be a superior manager in another firm because of the different skills that may be required for some set of firm-specific problems. Furthermore, since the Board of the firm that is considering replacing its incumbent manager does not know the reactions of another firm to particular states of the world as well as it knows its own, it may not be possible for that Board to determine the ability of other managers from the performance of their current firm. Given these problems, we simply assume that the ability of any particular alternative manager is unknown to the Board; however, we assume the Board knows the distribution of the abilities of the alternative managers from which they will choose.

The seeming simplicity of the search is purposeful. This model is not meant to be a search model in the sense that we are looking for the optimal manner for the Board to look for a new manager. Rather we are modeling the uncertainty that will be present in any search. As long as there exists uncertainty of some type in the search process, our results will hold. We avoid modeling the search procedure explicitly for simplicity. Our only assumption is that perfectly separating equilibria are not possible. That is, it is not possible for firms to offer compensation contracts that cause potential new managers to self select and reveal their ability. A secondary assumption that can justify this is simply to assume that managers possess only an unbiased expectation of their own ability. Thus, even if the firm could offer contracts designed to attract only "good" managers, there would still be some applicants for the job that only thought they were "good". Hence, there would still be some uncertainty about the true ability of the manager that the firm finally selected.

While the random drawing of a replacement may seem unrealistic, there are alternative interpretations of this drawing that may be more intuitive. For instance, assume that the Board has gone through some type of optimal search procedure and now possesses a "short-list" of potential candidates. The Board must now choose from among that short-list and this involves choosing a replacement from among a group, the same situation presented in our model. Alternatively, the Board may be considering a single person as a possible replacement for the incumbent. In this case the distribution of managerial talent in the model can be viewed as the Boards perceived distribution on the unknown ability of the single candidate.

The ability levels of managers in the economy is assumed to be distributed with the probability density function $f_a(\tilde{a})$. The density has support (ℓ, A). The entire "pool" of managers, (ℓ, A), is not necessarily available to the firm when choosing a replacement manager. The Board of directors chooses from a truncated version of $f_a(\tilde{a})$ with upper bound a_u. We assume that $a_u \equiv a_u(c)$ where c is the cost of a search for an alternate manager and $a_u' > 0$. We define cost of search as the present value of all incremental expenses related to hiring a replacement. Thus, cost of search in this paper includes such expenses as advertising the position and interviewing candidates; but more importantly the present value of the compensation plan that is offered to potential replacements. The present value of the compensation plan presently being given to the incumbent is denoted as k; therefore it is possible within our model for the Board to change compensation schemes when replacing management. Here, *c* will be the choice variable for the Board. They decide how much to spend on searching for an alternative manager and the more that they spend, the greater the upper bound on the pool of managerial abilities that is available to them[7,8].

Thus, when choosing a replacement manager, the Board of Directors chooses randomly from a conditional density of the form:

$$f_a(\tilde{a} \mid \tilde{a} \le a_u(c)) = \frac{f_a(\tilde{a})}{F_a(a_u(c))} \tag{2}$$

where $F_a(\cdot)$ is the cumulative distribution function of $\tilde{a}$.

The Board will replace the incumbent if the expected change in firm value (given a search cost, *c*, and a current compensation plan, k) is positive[9]. That is, replace the incumbent if:

$$E\left[V(\tilde{a}) - c + k - d - V(a_I)\right] > 0 \tag{3}$$

---

[7] If a "good" manager joins a "poor" firm, it may serve as a signal to the industry about the manager's ability. This will reduce the value of the manager's human capital. In order to be convinced to join the firm in question, the manager must be compensated for this loss through a large salary or incentives (or a signing bonus in the case of professional athletes). This is treated as part of the cost of search. Hence, a higher cost c means that the firm is willing to offer larger incentives to new managers and this will attract the interest of " a better class of managers". Therefore, the upper bound on the distribution is seen as an increasing function of c.

[8] The model presented here is a one-shot search model. This omits the possibility that the Board can improve its signal about the alternative managers' ability by spending c* dollars on search, observing the pool available (through direct observation of the people involved, i.e. interviews), then spending c**>c* dollars on a second search and choosing from the new candidates who come forward under the higher search cost.

[9] It can be shown that if a Board decides to search it will automatically decide to replace the incumbent with the alternative that is found (given that the ability of the new manager is still unknown). Thus, we ignore the search/not search problem and look exclusively at the equivalent replace/do not replace decision.

where *d* represents the "disruption cost" of replacing management. This *d* includes such things as the cost of switching over an entire firm to a new management style, the cost of replacing lower levels of management and suppliers/buyers that may have been loyal to the previous manager, the loss of opportunities while the new manager "learns the ropes", and the present value of any retirement benefits or payouts to the manager who has been replaced. The disruption cost could be seen as a choice variable on the part of the incumbent by the entrenchment arguments of Shleifer and Vishny [1989], but, since our model involves Board decisions only and is not of a game theoretic nature, we leave this to future research. Thus, the variable *d* is treated as a known in this case and, as the current value of the firm is observable, we may rewrite (3) as:

$$G \equiv E[V(\tilde{a})] - c + k - d - V(a_I) > 0 \tag{4}$$

where G is the gain from replacement function. The Board of Directors will replace the incumbent manager if G>0 for their optimal choice of *c*.

We will assume, for the moment, that the Board solves for their optimal c=c* and evaluates the gain from replacement function at that point. In Section II we will examine the actual first order condition that is generated.

B. An Average Incumbent Manager

Assume that the incumbent manager is of average ability with respect to the optimal pool of potential replacements. That is,

$$a_I = E^*[\tilde{a}]. \tag{5}$$

where the term $E^*[\cdot]$ refers to an expectation conditional on the optimum being chosen, i.e. $E^*[\cdot] = E[\cdot | a \le a_u(c^*)]$. Equation (4) then becomes:

$$E^*[V(\tilde{a})] - V(E^*[\tilde{a}]) > c^* - k + d \tag{6}$$

Equation (6) represents the condition under which the Board of Directors will choose to replace an incumbent manager that they know to be of average ability (with respect to the available pool of replacements). Equation (6) implies that if it is not expected firm value maximizing to replace an average manager, then it will also not be optimal to replace a manager who is above average.

Using the properties of the firm value function and Jensen's Inequality, it is apparent that:

$$V(E^{*}[\cdot]) > E^{*}[V(\cdot)]$$

Thus, the left hand side of equation (6) is always negative. This results in the conclusion that it is never rational for a value-maximizing Board of Directors to replace a manager who is of average (or above average) ability (as long as c^*-k+d is greater than or equal to zero, which will be discussed below). Note that the result holds *even if the costs of replacing the incumbent are zero* (i.e. the Board's expenditure on searching for and hiring a replacement is equal to the current compensation being given to the incumbent and there is no disruption cost).

The inequality in (6) may hold if $c^*<k$. That is, (6) may hold if the optimal action for the Board is to hire a replacement at a lower rate of compensation than his predecessor. Still, even in the case where $c^*<k$, as long as $d>k-c^*$ then the conclusion of non-replacement of average managers goes through. Intuitively, we feel that the disruption cost will be large as compared to salaries and search costs. Remembering that the disruption cost includes any termination payouts to the incumbent, it seems likely that any decrease in compensation for a new manager will be more than offset by the cost, d. Moreover one may assume that the Board considers the replacement decision during periodic evaluations of the manager. Since the current compensation of the incumbent, k, would have had to be an optimal contract at the time the current manager was hired, then barring a change in the firm since the incumbent was hired (e.g. a change in the shape of the value function), k should still be the optimal contract to offer a replacement. That is, without a change in the value function, c*=k (ignoring the direct costs of search momentarily) and inequality (6) will not hold for an average manager. Therefore, our results should go through in most (although admittedly not all) cases.

This conclusion is extended below to show that there is a range of abilities *below* the optimal mean for which a rational board will not replace the incumbent. The question of interest is how far below the mean of the optimal distribution must the incumbent's ability be before the board replaces.

C. A Below Average Incumbent Manager

Consider an incumbent manager who is of below average ability with respect to the optimal pool of potential replacements. That is,

$$\begin{aligned} a_I &= E^*[\tilde{a}] - \varepsilon \\ \varepsilon &> 0 \end{aligned} \tag{7}$$

The Board of Directors will replace the incumbent if:

$$E^*[V(\tilde{a})] - V(E^*[\tilde{a}] - \varepsilon) > c^* - k + d \tag{6a}$$

We would like to determine the level of managerial ability at which the Board will be indifferent between replacing or keeping the incumbent, a_I^{ind}.

The indifference point occurs where the left hand side and right hand side of (6a) are equal. Given that the firm value function is invertible, equality will obtain when:

$$\varepsilon = E^{*}[\tilde{a}] - V^{-1}\left[E^{*}[V(\tilde{a})] - c^{*} + k - d\right] \qquad (8)$$

Therefore, the indifference point will be at the level of ability:

$$a_{I}^{ind} = E^{*}[\tilde{a}] - \varepsilon$$

$$(9)$$

$$a_{I}^{ind} = V^{-1}\left[E^{*}[V(\tilde{a})] - c^{*} + k - d\right].$$

As long as d>k-c*, then ε>0. Equation (9) says that the Board of Directors is indifferent to replacement when the ability of the incumbent is equal to the inverse of the expected value of the firm after replacement. The Board will replace the incumbent when the manager's level of ability is less than a_{I}^{ind} from (9). Thus, there exists a range of below average abilities for which it is not rational for the Board to replace.

Figure 2-1 shows the basic structure of the model when, for simplicity, it is assumed that d=k-c*. One can easily see an alternative interpretation of a_{I}^{ind}. It is simply a "certainty equivalent manager". Given this interpretation, it can be shown that ε can also be represented by (the derivation is given in the appendix):

$$\varepsilon = -\frac{1}{2}\sigma_{a}^{2}\frac{V''(E^{*}[\tilde{a}])}{V'(E^{*}[\tilde{a}])} + \frac{c^{*} - k + d}{V'(E^{*}[\tilde{a}])}$$

(8a)

Again, it is apparent that as long as d>k-c*, then ε>0. Of course, it is possible (although probably rare) to get the opposite situation. This would give the interesting, but perverse, situation of rational Boards firing above average managers

This finding indicates that the apparent lack of disciplinary action on the part of Boards when confronted with what are deemed "bad" managers is not necessarily the result of irrationality on the part of the Board nor a lack of concern with the objectives of shareholders. Rather, there does exist discipline of the manager within the firm, but it simply does not pay to replace the manager in all circumstances. The result applies even if d=0 and c*=k. This means that the following, seemingly counter-intuitive, situation is possible: assume that an incumbent manager falls within the range of below average managers for which replacement is not optimal as described above. Further, assume that d=0 and that c*=k. This implies that the Board could replace the incumbent with no disruption to the firm, could pay the new manager less than the incumbent (since c* includes compensation as well as direct search costs) and would expect this "cheaper" manager to be better than the one they have now, yet the Board would choose not to do this. Most importantly, the choice not to fire the incumbent is entirely rational and in the interests of shareholders.

III - Maximization Problem

We now turn to explicit consideration of the maximization process followed by a rational Board of Directors when considering the replacement of an incumbent manager. The optimal search cost is that which maximizes the gain from replacement and solves:

$$\underset{c}{Max}\, G = \underset{c}{Max}\left\{ \int_{\ell}^{a_u(c)} V(\tilde{a}) \frac{f_a(\tilde{a})}{F_a(a_u(c))} d\tilde{a} - c + k - d - V(a_I) \right\} \tag{10}$$

The first order condition for (10) is:

$$E^*[V(\tilde{a})] = V(a_u(c^*)) - \frac{F_a(a_u(c^*))}{a_u'(c^*) f_a(a_u(c^*))} \tag{11}$$

Substituting equation (11) into the definition of the gain function from (4) gives the maximum expected gain possible if the Board replaces the incumbent:

$$G^* = V(a_u(c^*)) - \frac{F_a(a_u(c^*))}{a_u'(c^*) f_a(a_u(c^*))} - c^* + k - d - V(a_l) \qquad (12)$$

The incumbent will be replaced if $G^* > 0$ which occurs if:

$$V(a_u(c^*)) - V(a_l) > c^* - k + d + \frac{F_a(a_u(c^*))}{a_u'(c^*) f_a(a_u(c^*))} \qquad (13)$$

Thus the replacement decision is dependent on the relative levels of the greatest *possible* gain in value given replacement and the costs associated with replacement. $F_a(a_u(c^*))$ is a measure of the size of the optimal pool with respect to the economy-wide pool. It can be viewed as a supply of relative managerial quality. The last term on the right hand side of (13) is the product of the inverse of the elasticity of this supply with respect to search costs and the search cost. That is, the supply elasticity of quality is $\eta = \left[\frac{\partial F}{\partial c}\right]\left[\frac{c}{F}\right]$. The last term in (13) is $\left[\frac{1}{\eta}\right]c^*$. The more elastic the supply, the smaller is this term since the Board is choosing from a managerial pool with higher mean abilities.

Note that the explicit derivation of the maximization problem faced by the Board of Directors is not central to the man conclusion of the paper, that Boards may rationally retain some below average managers. However, it is included because we feel that there exists substantial potential for its exploitation in deriving comparative statics across industries. Specifically, there may be differences in rates of retention of managers in industries characterized by different value functions (possibly expanding versus contracting industries), elasticity of managerial supply et cetera that may lead to empirically testable conclusions for the model. However, this is left to future research.

IV - Generalized Model

A. Noisy Model

Now assume that the firm's value is a function of managerial ability and a noise term. That is, the value function is now $V(\tilde{\theta})$ where $\tilde{\theta} = \tilde{a} + \tilde{\gamma}$. As before, $\tilde{a}$ is a random variable denoting managerial ability while $\tilde{\gamma}$ is a random variable representing noise. We assume that $\tilde{a}$ and $\tilde{\gamma}$ are independent. The probability density function for the noise component is $h(\tilde{\gamma})$. The value function retains all the properties described in the perfect information case.

We assume that the incumbent manager is an endowment of the firm, drawn from the full distribution $f_a(\tilde{a})$. As in the previous section, any management changes take place by drawing a manager from the truncated distribution $f_a(\tilde{a} | \tilde{a} \leq a_u(c))$.

Given the above, the board of directors can use the convolution formula to compute the marginal distribution of $\tilde{\theta}$. This yields:

$$f_\theta(\tilde{\theta}) = \int_{\ell}^{A} f_a(s) h(\tilde{\theta} - s) ds \tag{15}$$

With this information the Board can use the observation of $\tilde{\theta}$ to formulate beliefs about the incumbent manager's ability. That is, they can make use of the conditional distribution function

$$f_{a/\theta}(\tilde{a} | \theta) = \frac{f_a(\tilde{a}) h(\theta - \tilde{a})}{\int_{\ell}^{A} f_a(s) h(\theta - s) ds} \tag{16}$$

Using (16), the Board formulates an expectation of the gain from replacing the incumbent manager. We assume that the Board is rational and will follow an optimal search strategy. If the expected gain from a change of managers is positive, the Board will replace; otherwise, they will retain the incumbent.

In our model the replacement decision involves the following steps:

(i) The board of directors observes current firm value and inverts the value function to extract the realization of θ at time 0.

(ii) Using information from step (i) and $f_{a|\theta}(\tilde{a}|\theta)$, the Board calculates their belief of the incumbent manager's ability. This belief is $E_{a|\theta}(\tilde{a}|\theta)$. Denote this belief $\overline{a_I}$.

(iii) The Board formulates an expectation of the value of the firm next period, period 1, under the incumbent. Denote this value of the firm in period 1 as V_1. In doing this we assume that they take their belief of the incumbent's ability as given and simply substitute this into the value function. That is, the Board calculates $E_\gamma[V_1(\overline{a_I}+\tilde{\gamma})]$.

(iv) Using the above information the Board solves:

$$\max_c G = E_{\theta|a \le a_u(c)}[V_1(\theta)] - E_\gamma[V_1(\overline{a_I}+\gamma)] - c + k - d$$

If the value of this function when maximized is positive, the Board replaces the incumbent; otherwise they do not replace.

More formally, the objective function is:

$$\operatorname*{Max}_c G = \frac{1}{F_a[a_u(c)]} \int_\theta V_1(\tilde{\theta}) \left[\int_\ell^{a_u(c)} f_a(s) h(\tilde{\theta}-s) ds \right] d\theta - \int_\upsilon V_1(\overline{a_I}+\tilde{\gamma}) h(\tilde{\gamma}) d\gamma - c + k - d \tag{17}$$

where υ is the range of γ.

Solving for the first order conditions yields:

$$E_\gamma[V_1(\tilde{\theta})|a = a_u(c^*)] - E_{\theta|a \le a_u(c^*)}[V_1(\tilde{\theta})] = \frac{c^*}{\eta} \tag{18}$$

where η is as defined in the previous section.

We assume that (18) can be solved for a positive valued c^* and that the second order conditions necessary for a maximum hold. We further assume that the solution is a unique global maximum.

Using (18), we can express the maximized gain function as:

$$G^* = E_{\theta|a \le a_u(c^*)}[V_1(\theta)] - E_\gamma[V_1(\overline{a_I} + \gamma)] - c^* + k - d \tag{19}$$

Henceforth, let the superscript * on an expectation operator denote that expectation conditional on $a \le a_u(c^*)$.

B. Average Managers and Below Average Managers

When the board of directors observes the realization of θ they formulate a belief of the incumbent manager's ability. Suppose the Board believes the incumbent is of average ability relative to the optimal truncated distribution of managers. That is,

$$\overline{a_I} = E_a^*[\tilde{a}]$$

Substituting this into (19) yields:

$$G^* = E_\theta^*[V_1(\tilde{\theta})] - E_\gamma[V_1(E_a^*[\tilde{a}] + \gamma)] - c^* + k - d$$

The Board will replace the incumbent manager if:

$$E_\theta^*[V_1(\tilde{\theta})] - E_\gamma[V_1(E_a^*[\tilde{a}] + \gamma)] > c^* - k + d \tag{20}$$

Use the law of iterated expectations to get:

$$E_\theta^*[V_1(\tilde{a} + \tilde{\gamma})] = E_\gamma\{E_{\theta|\gamma}^*[V_1(\tilde{a} + \tilde{\gamma})]\} = E_\gamma\{E_{\theta|\gamma}^*[V_1(\tilde{\theta})]\}$$

Also, $E_a^*[\tilde{a}] = E_{\theta|\gamma}^*[\tilde{\theta} - \tilde{\gamma}]$ as $\tilde{\theta} = \tilde{a} + \tilde{\gamma}$.

Using these facts (20) can be restated as

$$E_\gamma\left[E_{\theta|\gamma}^*[V_1(\tilde{\theta})]\right] - E_\gamma[V_1(E_{\theta|\gamma}^*[\tilde{\theta} - \tilde{\gamma}] + \tilde{\gamma})] > c^* - k + d \tag{21}$$

This simplifies to

$$E_\gamma\left[E_{\theta|\gamma}^*[V_1(\tilde{\theta})]\right] - E_\gamma[V_1(E_{\theta|\gamma}^*[\tilde{\theta}])] > c^* - k + d \tag{21a}$$

But Jensen's Inequality states that

$$V_1(E^*_{\theta|\gamma}[\tilde{\theta}]) > E^*_{\theta|\gamma}\left[V_1(\tilde{\theta})\right]. \tag{22}$$

Thus, (22) implies that the left hand side of (21a) is non positive. Therefore, the Board will not replace a manager whom they believe to be of average ability (again, under the assumption that d>k-c*)

Given the above result, the question arises as to what perceived level of ability will be necessary to induce the board to replace the incumbent. To answer this we suppose the Board believes the incumbent to be of below average ability. That is,

$$\begin{aligned} \bar{a}_I &= E^*\left[\tilde{a}\right] - \varepsilon \\ \varepsilon &> 0 \end{aligned} \tag{23}$$

We define ε as the difference in perceived ability from the mean of the optimal distribution that leaves the Board indifferent between replacing or retaining the incumbent. The replacement condition can therefore be written as:

$$E_\gamma[E^*_{\theta|\gamma} V_1(\tilde{a} + \tilde{\gamma}) - E_\gamma V_1(E^*_a[\tilde{a}] + \tilde{\gamma} - \varepsilon) = c^* - k + d \tag{24}$$

Solving this equation for ε will define the entire range of perceived below average managers who will not be replaced by a rational board.

Rewrite (24) as

$$E_\gamma\left[V_1(E^*_a[\tilde{a}] + \tilde{\gamma} - \varepsilon)\right] = E^*_\theta\left[V_1(\tilde{a} + \tilde{\gamma})\right] -- c^* + k - d \tag{25}$$

To avoid the non-linearity of the solving this for ε, we approximate this function by taking a first-order Taylor series expansion of the left hand side of (25) around $E^*_a[\tilde{a}] + \gamma$. This approximation yields:

$$E_\gamma\left[V_1(E^*_a[\tilde{a}] + \tilde{\gamma}) - \varepsilon V_1'(E^*_a[\tilde{a}] + \tilde{\gamma})\right] \approx E^*_\theta[V_1(\tilde{a} + \tilde{\gamma})] - c^* + k - d \tag{26}$$

Rearrange (26) to get

$$\varepsilon \approx \frac{E_\gamma\left[V_1(E_a^*[\tilde{a}]+\tilde{\gamma}) - E_{\theta|\gamma}^* V_1(\tilde{a}+\tilde{\gamma}) + c^* - k + d\right]}{E_\gamma V_1'(E_a^*[\tilde{a}]+\tilde{\gamma})} \qquad (27)$$

Again, $\varepsilon > 0$ will hold under almost all circumstances.

V - Conclusions

There are many examples of top executives who are perceived to be performing poorly in their roles, either by shareholders, the business press, or other stakeholders. These groups observe that these "bad" managers are not replaced by the Boards of Directors and take this as evidence that these Boards are not serving the shareholders interests by monitoring and disciplining management. Boards then get the reputation as being "yes men" to the senior officers of the firm.

This paper shows that these conclusions do not necessarily follow from the perceived evidence. A Board of Directors which is rational may be unwilling to replace a manager that is known to be of below average ability. The reason behind this is quite intuitive; by replacing the incumbent manager with a new unknown manager, the Board runs the risk that the new manager may be worse than the one that they replaced. These conclusions hold in worlds where the Board receives either perfect or noisy signals regarding the incumbent manager's ability.

Although not considered in the model, there exists an alternative interpretation of the results based upon real options. Given that replacing a manager precludes a Board of Directors from replacing the new manager, at least for a while (i.e. a Board cannot keep replacing managers every period), then replacing an incumbent kills the *option* to replace. Thus, the expected value of the firm under the new manager must be greater than the value under the incumbent plus the value of this option. It is this option value that allows a below average manager to be retained.

In the model, it was assumed that the firm was unlevered and that the value function was akin to a production function with managerial ability as the input. This interpretation ignores the effect of the default option. Hiring a new manager of unknown ability can enhance the equity value of the firm because the increased uncertainty will raise the value of the default option to shareholders. This increase in value will mitigate the effect described in the paper as it will provide an incentive to replace management. However, the effect of the default option will be small for firms that have only a small probability of bankruptcy. Therefore, in the case of relatively healthy firms, the increase in the value of the default option will be minor. For firms that are close to bankruptcy, the default option effect may be dominant. Thus, non-replacement of some below average managers should hold for healthy firms, while for distressed firms it is possible that above average managers could be replaced in order to maximize equity value. The intuition of this statement is readily apparent. If a firm's Board of Directors believes that the firm will most likely go bankrupt, then it is in the shareholders' interests to replace the manager, no matter how able he or she is, in a last ditch attempt to survive. One could include the default option in the model by including the negative of any increase in its value in d, the disruption cost. The increase in value of the default option would therefore represent a negative cost to replacing the manager. Still, for firms that are not currently in financial distress, we feel that the basic findings of the model hold; it is not necessarily optimal for a Board of Directors that is acting in shareholders interests to replace a manager, even if that manager is known to be of below average ability.

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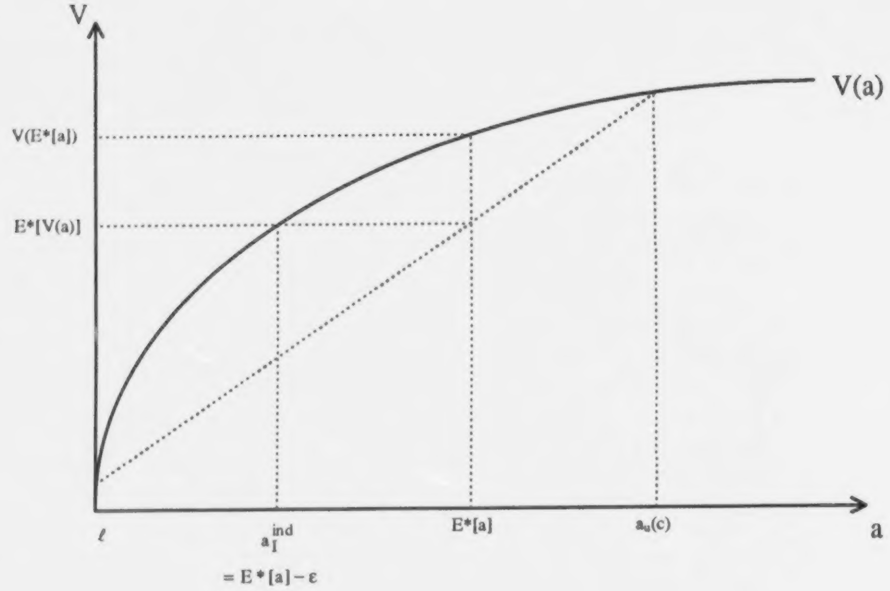
Figure 2-1

A Simple Representation of the Model


V
V(a)
V(E*[a])
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ℓ
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Chapter 3

Dividing the Pie: How Buyers and Sellers Share the Gains to a Sale of Assets

I - Introduction

Previous empirical literature on voluntary asset sales has consistently documented positive stock price reactions for the selling firm upon announcement of the sale. For instance, in early studies Hearth and Zaima [1984], Rosenfeld [1984], Alexander, Benson and Kampmeyer [1984], Jain [1985] and Klein [1986] all report significantly positive abnormal returns to the divesting firm. Later studies on sellers of assets have concentrated on explaining the cross-sectional variation in abnormal returns. The evidence on returns to the buyers of divested assets is mixed. Rosenfeld [1984], Jain [1985], and Sicherman and Pettway [1992] all find significantly positive abnormal returns for buying firms. However, Sicherman and Pettway [1987], Zaima and Hearth [1985],and John and Ofek [1995] find that returns to buyers are insignificantly different from zero.

The gains to an asset sale may come from three possible sources. First, there may exist synergies between the asset and the buying firm that do not exist with the selling firm (alternatively, there may be negative synergies with the current owner of the asset that would not be present with an alternative owner). Thus, the asset has a greater value to the buying firm than it does to the firm divesting the asset. Second, the sale of an asset may provide a signal to the capital markets. Several different types of signals may be associated with asset sales. If the asset was previously undervalued by the market, a sale at the "correct" price should lead to a rise in the stock price of the selling firm (note that there should be no effect on the buying firm's stock price). If the selling firm as a whole is undervalued, the sale of a piece of the firm could potentially correct this if the price received for the asset signals the true value of the entire firm. Asset sales could also signal the availability of valuable investment opportunities in other areas for the selling firm, which may be trying to raise the necessary capital to take advantage of them. Conversely, Boot [1992] suggests that asset sales can act as negative signals as they indicate the failure of the firm's management structure. Third, a sale of assets could be of benefit to the seller if the capital raised reduces the probability of financial distress or if it is used in positive net present value projects for which other sources of financing are unavailable.

This paper assumes that the effects of raising additional capital and of signaling are small in comparison to the gains in efficiency due to synergies (this holds only on average as it is perfectly reasonable to assume that *some* sell-offs are conducted mostly for their ability to raise capital)[1]. Hite, Owers and Rogers [1987] study examples of failed sell-offs in which the announced deal eventually fell through. They find that the gains made upon initial announcement of the sale dissipate by the time the deal is terminated. They conclude that the initial positive reaction to a sell-off announcement is not due to information signaling.

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[1] Alternatively, signaling can have a large effect, but these gains are negotiable. For example, if the selling firm shareholders gain due to a signal given to the capital markets, the buying firm can negotiate to have some of that gain accrue to it.

There are two things which determine the gains to a firm involved in an asset sale transaction. First[2], the total gains to the transaction, where the term "total gains" refers to the difference between the value of the asset to the buyer and the value of the asset to the selling firm. Second, the negotiation process determines how those total gains are divided between the firms. The purpose of this study is to make an initial attempt at looking at both of these factors simultaneously.

A number of previous studies have attempted to relate the gains to selling firms to their negotiating power, proxied for by some measure of the financial health of the firm. Rosenfeld [1984] and Hearth and Zaima [1984] use S & P quality ratings as an indication of financial strength and both find that higher quality sellers have larger average gains. Conversely, Zaima and Hearth [1985] find no evidence that S&P ratings are associated with the size of abnormal returns. Sicherman and Pettway [1992] find that selling firms experiencing a credit downgrade within the two years previous to the sale have significantly lower abnormal returns. Yeung and Sundaram [1994] find that announcement abnormal returns have a positive relationship to past changes in profitability, a positive relationship to past growth and a negative relationship with the firm's debt-equity ratio (although these factors are only significant for that sub-sample of firms which initially have a negative reaction to the sell-off announcement). Lang, Poulsen and Stulz [1995] classify firms as "poorly performing" by various measures and find no significant differences in abnormal returns over a two day event window (although there is some evidence of differences using an eleven day window). Findings on the negotiating power of buying firms are more limited. Sicherman and Pettway [1987,1992] and Zaima and Hearth [1985] find that the buyer's financial position has no significant effect on their abnormal returns.

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[2] The terms "first" and "second" are not meant to imply any type of temporal order.

One problem with most of the previous research is that it ignores two major factors determining the gains to each firm in a divestiture. (1) If negotiating power is, in fact, a determinant of the gains to a firm in an asset sale transaction, then the negotiating power of *both* parties should be of importance. Thus, it is possible that the characteristics of the buying firm have an effect on the size of the gains going to the selling firm (and vice versa). With two exceptions, previous research has not examined the role to be played in determining abnormal returns by the characteristics of the firm on the opposite side of the transaction. In a small sample (54 transactions) John and Ofek [1995] find that sellers get higher abnormal returns if the asset sold is in the same industry as the buying firm. Sicherman and Pettway [1992] find that a previous credit downgrade of the seller has no significant effect on the returns to the buyer (although it is associated with significantly lower abnormal returns to the seller). (2) If negotiations between firms determine the share of the total gains that each firm receives, then the size of the total gains to the transaction should also be a primary factor in determining the size of the stock price reaction to the sale. Previous research has not looked at the factors that determine the total gains.

If one finds larger gains to selling (or buying) firms under certain circumstances, the question that arises is whether this is due to more negotiating power, larger total gains or some combination of the two. More simply, the question is whether larger gains are due to getting a larger slice of the pie or the same slice of a larger pie (or even a smaller slice of a larger pie). Previous research has been unable to distinguish between these possibilities. Here, by looking at the returns to the buyers *and* the sellers of a sample of transactions, as well as examining the total gains, it is possible to more exactly determine how transactions are affected.

This research uses a matched sample methodology[3] in which a sample of transactions for which both the buyer and the seller have data available is used. In this way, the gains to the selling firm, the gains to the buying firm and the total gains[4] to the transaction can all be measured. Past research has relied on regressions run cross-sectionally across firms in order to explain abnormal returns. The benefit of a matched sample of buyers and sellers from the same transactions is that regressions can be run cross-sectionally across *transactions*. This helps not only to answer the question presented above but also to pick up factors that may systematically effect the total gains in a transaction but that have no systematic effects on the individual gains to the buyer and seller.

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[3] Sicherman and Pettway [1992] are the only other researchers to use such a matched sample. They do not examine the total gains to the transaction.

[4] "Total gains" refers only to the gains to shareholders in the two transacting firms. It ignores the effect of wealth transfers from bondholders as well as possible effects on other stakeholders in the divested unit (such as employees that may be laid off). Mayers and Singh [1992] find evidence of a negative average bond price reaction to the announcement of a divestiture *program*, while Brown,

Two main factors hypothesized to have an effect on the stock price reactions to asset sales will be examined to see if there is any systematic influence on any of the three measures of gains (buyer, seller and total). The two factors examined in this paper are the financial health of the firms and the existence of a threat of takeover on one of the firms. The factors are chosen because they can each be reasonably expected to have effects on the size of the total gains to a transaction as well as on the negotiating power of each party.

The evidence presented here shows that both the financial characteristics of the firms and the existence of a previous takeover threat on the selling firm affect the total gains to a transaction as well as the breakdown of those gains between the parties to the transaction. If the seller has recently been under the threat of takeover, the total gains to the transaction are significantly lower. This reduction in available gains, however, is entirely

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James and Mooradian [1994] find abnormal bond returns on announcement of a sale by a distressed firm to be insignificantly different from zero.

borne by the buying firm. There is weak evidence that this is due to increased competition (on the buying side) for the assets of threatened firms. The results on the financial characteristics of the two firms reveal that the greatest total gains come in transactions where assets are transferred from firms with loose capital constraints to firms with tighter constraints. Furthermore, it seems that better financial performance for a firm (on either side of the transaction) *lessens* the bargaining power for that firm. The effect of the financial characteristics of the firms on bargaining power is explained by the effect of poor firm performance as an incentive device for management.

The rest of the paper is organized as follows: Section II discusses in more detail the factors hypothesized to affect the gains to the transaction, Section III provides details on the event study methodology and the sample, Section IV presents some basic characteristics of the sample, Sample V presents the findings of the analysis and Section VI gives some brief conclusions.

II - Hypothesized Effects on Gains

This section discusses the possible effects on selling firm gains, buying firm gains and total gains of the existence of a takeover threat on one or both of the firms and of the financial characteristics of the firms. The study of these factors is complicated by the fact that they may have an effect on the size of the total gains to the transaction as well as on the negotiating position of the parties.

The threat of takeover can provide a powerful inducement to management to take action. There are two scenarios under which asset sales can be used to defend against an unwanted takeover. The firm could sell off divisions in an attempt to become more efficient. Divisions for which current management is not first best may be sold off in order to increase firm value and therefore avoid a takeover. However, asset sales could also be used to raise cash to help fight a hostile bid or to rid the firm of the assets that are attracting bidders in the first place (the crown jewel defense). Each of these scenarios has a different implication for the total available gains to an asset sale. In the first scenario, one would expect asset sales that follow takeover threats to lead to particularly high total gains whereas under the second scenario they may lead to low total gains as firms may even be willing to sell assets for which they are the first-best user. Thus, the effect of a takeover threat on a divesting firm can have either positive or negative implications for the total gains created in an asset sale.

A takeover threat preceding an asset sale also has implications for the negotiating position of the parties. A firm that is under threat of takeover may be quite motivated to make a sale quickly. This would tend to bias negotiations in favour of the buying firm as they would be the firm with the greatest patience (Rubinstein's [1982] model of non-cooperative bargaining has "patience" as the key factor in determining the share of each party). Donaldson [1990] states that " under the fire of hostile attack...companies can and do divest hundreds of millions of dollars of going concern value. But a fire sale puts the vendor in an impossible bargaining position." Alternatively, a takeover threat may be associated with releases of information concerning the value of the target firm. This might eliminate any advantage the buying firm may have in bidding for an asset that the market undervalues. As well, a takeover threat could serve as a signal to other firms that assets may be sold. In this way, asset sales that follow takeover threats on the selling firm may have more competition on the buying side. This will tend to erode the bargaining position of the buyer, especially in light of the fact that most asset sales (at least those outside of a takeover threat on the seller) are done as "private placements" between a seller and a single buyer. Of course, the bargaining position of the buying firm can be further eroded if the buyer is acting as a type of White Knight and is buying the asset in order to help fight the threat on the seller.

For this research, the financial health of the firms party to the transaction is measured by three financial ratios: income divided by assets, the interest coverage ratio and the ratio of long term debt to assets. The logic in much of the previous research on asset sales says that firms that are more financially sound will have greater bargaining power and will therefore be able to garner a greater share of the total gains to the transaction for themselves. There may also be agency considerations that affect bargaining power and that differ over firms of different financial strength. Lang, Poulsen and Stulz [1995] base their analysis of asset sales on the premise that asset sales are done by managers that do not have access to capital markets (at least not without great cost) and wish to raise capital for their own uses (e.g. to fight a takeover or invest in NPV<0 projects that management values). In essence, managers may be attempting to create free cash flow (as per Jensen [1986]) This type of sale will most likely be done by firms that have been performing poorly and/or have low interest coverage ratios as those are the firms that are less likely to have free cash flow already under management's control. Thus, selling firms of low financial strength may lack bargaining power because management is conducting the sale for its own reasons and therefore may not be as concerned with maximizing the price obtained as they are with completing the sale.

Conversely, agency considerations may also mitigate the extra bargaining leverage supposedly enjoyed by firms of high financial strength. Buying firms with high profitability, low debt and high interest coverage ratios will tend to have a larger amount of available capital upon which to draw. The extra capital at the disposal of these firms means that they may not be as concerned with "driving a hard bargain" as would more capital constrained firms[5]. Hence, financial health (and the attendant lack of capital market discipline) may give rise to agency problems through shirking in negotiations. The same problems could also be present in selling firms of high financial strength. Taylor [1988] conducted interviews of managers involved in divestiture decisions. Her study provides some evidence of shirking through the statements of one executive vice-president who states that the public announcement of an upcoming divestiture is, despite the extra competition among buyers it may create, troublesome because it can result in being "deluged with people that think they're going to get a super bargain" (pg. 107).

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[5] Although not strictly a sell-off, the IBM purchase of Lotus comes to mind as an illustration. IBM's initial bid price for Lotus was quite high and most analysts put this down to IBM's large resources

The financial strength of the firms can also have an effect on the size of the total gains available in a deal. If financial resources are an indication of the ability of a firm to efficiently operate an asset (either because of good management being reflected in financial strength or because additional capital resources means that the investments necessary to make the asset operate efficiently can be made[6]), the greatest increase in efficiency will come from those asset sales in which an asset is sold by a financially weak seller to a financially strong buyer. On the other hand, financially weak sellers may wish to raise capital to avoid distress and therefore be willing to engage in sell-offs for which there are few overall gains, but for which they will receive the capital influx necessary to stave off creditors. Financially strong buyers

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and their desire to avoid a lengthy takeover battle. Simply put, IBM may have paid more than it had to because it had lots of money and did not want to wait to spend it.

[6] In other words, some of the gains to a transfer of assets may come from the buyer having more financial slack (in the Myers and Majluf [1984] sense) than the seller and hence not foregoing positive net present value investments in the asset.

may also be subject to management's use of free cash flow. Buyers more likely to possess free cash flow are more likely to engage in transactions with fewer total available gains.

In summary, both the threat of takeover and the financial health of the firms can have conflicting implications for the size of the total gains to a sell-off as well as the breakdown of those gains between the parties. The purpose of this research is to examine these factors across a large sample of transactions in order to determine their effect on both the total gains and the distribution of bargaining power in an asset sale. Previous research has not looked at the total gains to a transaction and has not attempted to examine bargaining power in this manner.

III - Sample and Methodology

The initial sample consists of all of the voluntary sell-offs announced in *Mergers and Acquisitions* between 1982 and 1991, inclusive. Sales of assets classified as having SIC codes between 60 and 64[7] were excluded because of the regulatory environment. Also excluded were those sales for which no announcement was made in the Wall Street Journal (WSJ). The day of the first announcement of the sale (or possible sale) was taken as the event date for the selling firm, while the first mention in the WSJ of the buyer was taken as the event date for the buying firm[8]. Transactions were excluded if there were other WSJ announcements for either firm in the two days preceding the event date. Sales were omitted if their event dates were after the effective date of the sale as given in *Mergers and Acquisitions* (indicating that the sale may have been public knowledge before the WSJ announcement), if the selling firm was in bankruptcy or very recently emerged from bankruptcy (so as to concentrate on purely voluntary divestitures), and also if the firm stopped trading before the effective date of the transaction. Finally, only those transactions for which *both* buyer and seller were listed on NYSE or AMEX and had returns available on the CRSP files were kept.

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[7] Depository institutions, nondepository credit institutions, security and commodity brokers, insurance.

The final sample consists of 424 transactions (848 firms). Of these, in only 414 cases was financial data[9] available for both the buying and the selling firm. Thus, regressions involving financial ratios are based on this slightly smaller sample.

A firm was considered to be under the threat of takeover if there was either (1) an article in the WSJ documenting a takeover bid for the firm in the year prior to the event date or (2) an article in the WSJ (again, in the year previous to the announcement of the asset sale) concerning rumours of takeover activity surrounding the firm or other indication that the firm is "in play". As not all takeover threats may be public knowledge, firms were also classified by whether any mention was made in the WSJ of new takeover defenses (e.g. a poison pill) being adopted. The adoption of new defenses may indicate at least management's perception of a threat.

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[8] Therefore, for a single transaction it is possible to have different event dates for buyer and seller. This will occur if the seller initially announces its desire to sell the asset, but does not yet have a buyer or if it announces plans to sell the asset to an as yet unnamed buyer.

[9] Most of the financial data is collected from COMPUSTAT, although the data for some firms was collected by hand directly from their financial statements if they were not listed on COMPUSTAT.

The study controls for the effect of several other variables that may have an effect on the stock market response to sell-offs. Klein [1986] and Sicherman and Pettway [1992] both find that the inclusion of a price in the initial announcement is associated with significantly higher abnormal returns. Also, the size of the divestiture has repeatedly been found to have a significantly positive effect on abnormal returns. For this study, size was measured by the price paid (when available) for the asset divided by the book value of assets. Mayers and Singh [1992] and John and Ofek [1995] find that sales that are part of an on-going program of divestitures receive significantly smaller abnormal returns on average (due to the market discounting much of the gain when the program becomes known). Firms were classified as being in a program of sales if there was a WSJ article announcing the start of a program in the year prior to the sale or if the firm had announced two or more other sales in the previous year[10].

The event study was conducted using market adjusted returns. Brown and Warner [1980,1985] have shown this methodology to be effective in detecting stock price reactions to specific events. Let R_{it} be the return to firm i on date t and R_{mt} be the return to the CRSP equally weighted index on date t. The abnormal return for firm i on date t is defined as $AR_{it}=R_{it}-R_{Mt}$. The day of the initial announcement of the asset sale is defined as the event date, t=0. The cumulative abnormal return for firm i for dates t=b to t=e is then:

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[10] The condition of two or more previous sales constituting a program is arbitrary. However, it would seem reasonable as Mayers and Singh [1992] find that the median time from a program announcement until the first actual sale is 70 trading days and the median time until the third sale is 254 trading days.

$$CAR_{i,(b,e)} = \sum_{t=b}^{e} AR_{i,t}$$

The null hypothesis to be tested is that the average CAR across firms is not significantly different from zero for some window around the event date. The standardized abnormal return for firm i on date t is defined as:

$$SAR_{it} = \frac{AR_{it}}{\hat{\sigma}_{AR_{it}}}$$

where:

$$\hat{\sigma}_{AR_{it}} = \sqrt{\sum_{j=t-240}^{t-11} \left(AR_{ij} - \overline{AR}_{it}\right)^2 \frac{1}{228}}$$

and:

$$\overline{AR}_{it} = \frac{1}{229} \sum_{j=t-240}^{t-11} AR_{ij}$$

The average standardized abnormal return across N firms for date t is defined as:

$$ASAR_t = \frac{\sum_{i=1}^{N} SAR_{it}}{N}$$

Finally, the test of the null hypothesis of no reaction to the event is based upon the cumulative average standardized abnormal return over a window from t=b to t=e:

$$\mathrm{CASAR}_{b,e} = \sum_{t=b}^{e} \mathrm{ASAR}_t$$

It can be shown that, if stock returns are assumed to be normally distributed, then under the null hypothesis:

$$\mathrm{CASAR}_{b,e}\left[\frac{N}{e-b+1}\right]^{1/2} \sim N(0,1)$$

for large N.

A window from dates t=-2 to t=0 was chosen for analysis as this would include the actual event date as well as days in which there may have been prior information leakage concerning the sale.

Total gains to the transaction are estimated by taking a market weighted average of the three day CAR's for buyer and seller. Market weights are measured by the market value of common equity ten days prior to the event date.

IV - Basic Characteristics of the Sample and Event Study Results

The basic comparison of the financial characteristics of buying and selling firms (422 buying firms and 416 selling firms because of missing financial data) is contained in Table 3-1[11]. All figures are from the year prior to the year in which the sale was announced. The first three figures in Table 3-1 (book assets, book equity and market equity) are basic measures of the size of the firms. There is no significant difference in the mean size of buyers and sellers by these measures. Selling firms have significantly larger median values of book assets and book equity indicating that the selling firms are, on average, larger than the buying firms. This is in contrast to findings for takeovers in which large firms tend to takeover smaller firms. Sellers exhibit significantly lower income/asset ratios, have significantly higher book leverage and significantly lower interest coverage ratios. The general picture that emerges is that selling firms have not been performing as well as buying firms in the period leading up to the asset sale and have tighter capital constraints.

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[11] The tests for differences between buying and selling firms were also run using matched sample tests (including only those transactions for which financial data was available for both firms) and the results are identical.

CAR's for buyers and sellers starting 250 trading days before the event until 50 days after the event are presented in Figure 3-1. Although no statistical tests are done on this long window, the pattern is apparent. Sellers have been underperforming the market for the year leading up to the sale, while buyers have been outperforming the market. Note that industry effects are not taken into account here so one is not able to tell if buyers are in industries performing well against the market or if they are out performing their industry (similarly for sellers). The picture presented is consistent with the results on the financial ratios, assets are being sold by poor performers to good performers.

Of the 424 selling firms in the sample, 45 are classified as being under the threat of takeover and 38 had recently instituted a new takeover defense[12]. Of the 424 buying firms, only 17 were subject to a takeover threat, and 25 instituted a new defense[13]. The differences are significant at any conventional level. It seems, as expected, that takeover threats on a firm are associated more with sales of assets than with purchases.

Prices paid for the assets were obtained if reported in the WSJ (in the initial announcement or later articles) or the listing in *Mergers and Acquisitions*. A price was obtained in 278 cases. The average price was $162,262,700 and constitutes an average 9.63% of the book assets of the selling firm and 16.92% of the book assets of the buying firm. Thus, the average sale is a significant transaction to both the buyer and the seller. However, the sample has a large range of divestitures in terms of size and importance. It ranges from the 1982 sale by Lynch Corp. of its Cox Instruments electronics division to Ametek Inc. for $1.7 million, to the sale of British Petroleum's Industrial Holdings Corp. to American Express for $1.8 billion in 1987.

The results of the event study show that sellers have an average CAR of 1.10% (significantly positive at a 1% level) for the three day window from t=-2 to t=0. The median seller CAR is 0.36% (significantly positive at a 5% level in a Wilcoxon Signed Rank test). These results are similar to the results in previous studies. The buying firms' average CAR is 0.54% (significant at

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[12] In three cases, the firm instituted a defense and was also the subject of a takeover threat.

[13] Two buyers fall in both the "defense" and the "threat" categories.

1%) and their median CAR is 0.12% (significant at 10%). A standard t-test across buyers and sellers shows that the average CAR's are significantly different at a 10% level between the samples. The median CAR's are insignificantly different in both Rank Sum and Signed Rank tests. Thus, both firms gain on average in a transaction, and the percentage gain for the seller is larger than for the buyer (at least in the mean). The CAR's for buyers and sellers have a slight positive correlation of 0.0756. The average total gain to the transactions (a market weighted average of the buyer and seller CAR's) is 0.44% (significant at 1%). The median total CAR is 0.22% (significant at 1%).

V - Effects of Takeover Threats and Financial Condition

A. Effect of Takeover Threats

Table 3-2 contains tests of the significance of differences in CAR's for groupings of firms based on the existence of a takeover threat on one of the firms or the recent institution of a takeover defense by one of the firms. It is apparent from Table 3-2 that a takeover threat on the buyer, whether it be actual or implied by a new defense, has no significant effect on any of the CAR's[14]. For sellers, the recent institution of a new defense has no significant effect on any of the CAR's. However, when the seller has been subject to an actual threat of takeover, total CAR's are significantly lower. This indicates that sales following a takeover threat on the seller have, on average, fewer total gains than do other sell-offs. Perhaps even more interesting than the negative effect on total gains is the fact that a takeover threat makes no significant difference to the seller's CAR's[15], but buyer CAR's are significantly lower. In fact, in purchasing an asset from a threatened seller, the average buyer has a CAR equal to -1.07% and this is significantly negative at a 10% level. Thus, there is no evidence that takeover threats serve to "motivate" sellers to sell in that they do not seem to end up selling these assets for less than they otherwise would.

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[14] Buyer CAR's are insignificantly different from zero if there exists a takeover threat on the buying firm, but are significantly positive if there is no threat. This may provide some weak evidence that there is an effect from threats on buyers, but, the difference between CAR's in the two sub-samples is highly insignificant. A similiar story holds for the effects of the institution of a takeover defense by the buying firm.

Bhagat, Shleifer and Vishny [1990], using a sample of 62 takeover targets, examine the differences in post-offer divestitures for firms taken over and firms surviving a hostile threat. They find that targets of unsuccessful hostile takeovers subsequently divest the same amount of assets (measured as a fraction of the offer price) as do successful bidders. The interpretation of this result is that "firms escaping the takeover often do most of the things that the acquirer would have done anyway." The conclusion would seem to be that the threat of takeover induces firms to make efficiency enhancing divestitures. The findings on this sample seem to indicate the opposite[16].

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[15] Selling firm CAR's are insignificantly different from zero if there exists a takeover threat on the firm and are significantly positive if there is no threat. this may provide weak evidence that a threat affects the returns to sellers, however, the difference between CAR's in the two sub-samples is insignificant.

[16] This assumes that the divestitures undertaken after a successful takeover are similar to those performed by sellers not under a takeover threat. Kaplan and Weisbach [1992] study acquisitions made between 1971 and 1982 and subsequently divested by 1989. Kaplan and Weisbach state that the results of the event study on the divestitures are "consistent with previous work" on asset sales.

Threatened sellers make divestitures with fewer total gains, indicating that they may be selling assets strictly to protect themselves. The protection implied by the results here seems not to be due to increased efficiency but possibly to such things such as the extra cash that is now available to fight a takeover or the use of a crown jewels defense. The decrease in total gains seems to be absorbed entirely by the party on the purchasing side of the transaction. In fact, the average buying firm in this situation should expect a stock price decrease upon announcement of the transaction. The difference between the interpretation of the results of Bhagat et al. and the results presented here is due to the fact that Bhagat et al. look only at the quantity of post-threat divestitures while this research uses total gains as an estimate of the quality. While the dollar value of divestitures subsequent to an unsuccessful takeover threat is similar to that after a successful takeover, the results here show that those asset sales are of a lower quality (in terms of the overall gains to trade). One should note, however, that the results presented here do not contradict the results of Bhagat et al., only the conclusions that they draw. Table 3-2 shows that the sellers' CAR's are unaffected by the threat of takeover, it is only through the examination of the buyers' CAR's (and total gains) that the inefficiency of post-threat asset sales becomes apparent. Bhagat at al. look only at the sellers.

A negative average CAR for buying firms is consistent with an agency interpretation of the behaviour of buyers in which they act in the interests of the selling firm rather than their own shareholders (e.g. acting as a white knight). It is also consistent with increased competition for assets after a takeover threat resulting in buying firms being systematically subject to the winner's curse. The finding does not seem to be consistent with a takeover threat resulting in a release if information and therefore the elimination of underpricing of assets as this would, at the most, only be expected to drive buyer returns to zero.

In order to see if the effects described above hold up when controlling for the financial condition of the firms, the total CAR's, buyer CAR's and seller CAR's were all regressed[17] on the following variables:

TOOFFERS = 0 if there was no threat on the seller
=1 if there was a threat on the seller
PROGS = 0 if the seller is not in a program
=1 if the seller is classified as being in a program
of sales
PROGB =0 if the buyer is not in a program

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[17] For purposes of the regressions, from the original sample of 424 transactions, ten are deleted because of the unavailability of financial data for either the buyer or the seller. Also deleted are 8 transactions for which either the buyer or the seller reported zero interest expense (one case of the seller having zero interest expense and seven cases of the buyer). Leaving 406 transactions for the regressions. The zero interest expense firms are deleted because the interest coverage ratio is undefined for these firms. Also, the coverage ratio is meant to measure how easily a firm can meet its fixed obligations, it seems unlikely that a firm would have absolutely no fixed obligations (note also that COMPUSTAT reports net interest expense for some firms, meaning that these firms may have some obligations) and therefore an infinite coverage ratio is misleading. Thus, these outliers are omitted from the regressions.

=1 if the buyer is classified as being in a program of purchases

ROAB, ROAS= the income before extraordinary items divided by book assets of the buyer and seller respectively

INTCOVB, INTCOVS=the interest coverage ratio for the buyer and seller respectively

DAB, DAS = long term debt divided by book assets for the buyer and seller respectively

SIZES = 0 if a price is not available for the transaction

=(price/book assets of seller) if a price is available for the transaction

SIZEB =0 if a price is not available for the transaction

=(price/book assets of buyer) if a price is available for the transaction

SIZET =0 if a price is not available for the transaction

=(price/(book assets of buyer + book assets of seller)) if a price is available for the transaction

The first two variables control for the divestitures being within programs and therefore possibly having had some of their effect already discounted by the market. The SIZES and SIZEB variables control for the size of the transaction with respect to the buyer and with respect to the seller for those transactions for which a price was available[18]. The size of the transactions for regressions on the total gains is controlled for through the SIZET variable.

Table 3-3 contains the results of the regressions on the three dependent variables[19]. It is evident that the effect of a threat on the seller found in the mean CAR's is still present when controlling for the other variables. The coefficient on the threatened seller dummy is significantly negative in the regressions on buyer CAR's and on total CAR's, but is insignificant when regressed on seller CAR's. Discussion of the results for the financial variables will be left until later in this section.

In an attempt to distinguish between the hypothesis of buying firms acting as white knights and the hypothesis of buying firms competing with one another after a takeover threat on the seller, the WSJ Index was used to determine if the initial announcement of the sale by the seller included mention of a signed agreement with the buyer (or if the sale was announced upon its completion). If the effect of a takeover threat is due to increased competition for assets, one would expect to see fewer sales announced with an agreement already in place and more cases of the seller announcing that the asset is up for sale (so that the seller could take advantage of the competition by attracting more buyers). Of course, this is not a very strong measure in that sales announced with a signed agreement may have gone through a silent auction wherein multiple bidders considered the acquisition but were simply not reported in the media. Still, a significant difference in the proportion of signed agreements between those sellers under a threat and those which are not would be suggestive. For the entire sample of 424 transactions, 156 initial announcements (37%) included mention of a signed agreement (or were announcements of completed deals). For selling firms not subject to a takeover threat, 136 out of 379 (36%) announcements included a signed agreement. For selling firms that were the subject of a takeover threat, 20 out of 45 (44%) had announcements including a signed agreement. Hence, a greater proportion of threatened sellers announced signed agreements when the sale was first announced, giving no indication of the seller attempting to take advantage of increased competition; however, the difference in these proportions is not significantly different at a 10% level.

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[18] If a dummy equal to one if the price is revealed and 0 otherwise is added to the regressions reported in the paper the results do not change.

[19] All regressions also controlled for the log of the market value of equity of the firm as this is known to have an effect on CAR's. The results for this variable are not reported.

In order to facilitate a second attempt at distinguishing between the increased competition and White Knight hypotheses as explanations for the negative mean returns for buyers following a takeover threat on the seller, the sample of transactions was divided into two: those for which the total gains were positive and those for which they were negative. The maintained hypothesis is that those transactions with positive total gains are entered into in order to obtain the benefits of synergies (the benefits being reflected in the gains) whereas those transactions with negative gains have no synergistic gains and are entered into for other reasons. The maintained hypothesis is supported by the regressions in Table 3-4. Table 3-4 contains regressions of the buyer CAR's on the seller CAR's for the two subsamples. For the subsample of transactions with positive total efficiencies, there exists an insignificant positive relationship between the returns to the two firms. For the subsample of transactions with negative total efficiencies, there exists a significant negative relationship between the returns to the firms. Thus, in this subsample it seems that firms gain at the expense of the other party. This is consistent with no synergies existing for the negative total gains sample and the motivating factor for these transactions being a wealth transfer between firms.

Logic holds that if a takeover threat on the seller induces more competition to buy the assets, then the competition should be fiercest for those assets for which there exist potential synergies[20]. Conversely, if the negative effect of a takeover threat on buyer abnormal returns is due to the collusion between the buyer and the seller to preserve the position of seller management, then one would expect to see the largest effect of a takeover threat in the sample for which there do not exist any overall gains, as these transactions are more likely to be done for reasons other than synergistic ones.

Tables 3-5A and 3-5B contain the results of the regressions on the two subsamples. Unfortunately, the lack of power on the smaller samples means that, in both of the regressions on buyer CAR's, the coefficient on the takeover threat variable is insignificant. The lack of power derives from the fact that of the 45 cases in which the seller was the subject of a takeover threat, 26 fall in the negative total gains subsample and only 19 in the positive gains subsample. Note that the results on the buyer CAR's would be consistent with a takeover threat increasing the probability of the total gains being negative (and the buyer CAR's being drawn down along with it), but not affecting the buyer CAR's within any one subsample. However, the regressions on the total gains reveal that, even with the reduced power, a threat on the seller is associated with significantly lower total gains in the positive subsample and is close to significantly negative in the negative subsample (p-value of 10.4%), contradicting the idea that a threat simply affects the probability of negative total gains. As the TOOFFERS variable is significant for buyer CAR's on the whole sample, it is most likely a simple lack of power that leads to insignificant results in the subsamples. Still, some weak conclusions can be drawn from the subsample regressions on the seller CAR's. These reveal that a threat on the selling firm has a significantly negative effect on its CAR's when the total gains are negative. It seems that a threat also has a detrimental impact on seller CAR's, at least in those instances when the divestiture is more likely to have been done for reasons other than potential synergies. However, if total gains are positive the takeover threat dummy has an insignificantly positive effect on seller CAR's.

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[20] Assuming that there exist other firms, other than the final buyer, that are able to take advantage of these synergies.

Although insignificant, it is in contrast to the negative effect observed for the negative total gains subsample as well as the sample as a whole. Thus, there is some weak evidence that sellers gain if they have survived a takeover threat and if the sell-off has positive potential synergies. This is consistent with the increased competition hypothesis as sellers gain in those transactions for which one would expect the most competition.

B. Effect of the Financial Strength of the Firms

B. 1. Basic Results

Looking at the regressions across the entire sample in Table 3-3, one can examine the effects of the financial characteristics of the two firms on their CAR's. The results for the seller CAR's and for the total CAR's to the transaction show that neither the three seller ratios nor the three buyer ratios have any significant effect. This is inconsistent with the idea that weak sellers receive lower CAR's due to a lack of negotiating power and also with sellers receiving smaller gains if negotiating with financially strong buyers. The regression on buyer CAR's reveals that the Income/Assets ratio of the buyer in the year preceding the purchase is negatively associated with buyer CAR's. It seems that buyers who have been performing well receive fewer gains than do poorly performing buyers. One possible explanation for this is that it is buyers who have been performing poorly that have the most to gain from a change in their asset configuration. However, there is no significant effect of ROAB on the total gains, indicating that there is no increase in overall synergies when the buyer is performing poorly. This may be due to a small change in gains for the buying side being diluted (and therefore appearing insignificant) in the total gains[21]. At any rate, there is no evidence to support the claim that buyers that are performing well should do better because of a better ability to run the asset efficiently or because of greater negotiating power in the sale.

The coefficient on the seller's interest coverage ratio is significantly positive in the regression on buyer CAR's (insignificant in the other two regressions). Buyers receive lower average gains on announcement of a purchase if they are transacting with firms that are harder pressed to meet interest obligations. Strangely, it seems that the greater the seller's need for cash, the worse the buyer does. This is at odds with the usual negotiating power hypothesis in which buyers gain an advantage in transactions with weak sellers.

Even more interesting results are observed when the subsample regressions in Tables 3-5A and 3-5B are examined. A cursory examination of the regressions reveals the most basic results. First, the effects of the financial variables are different in the two subsamples, indicating that transactions with positive total gains may be different in some fundamental way from transactions with negative total gains. This supports the results of Table 3-4. Note that this difference between synergistic and non-synergistic divestitures would have been impossible to observe without the matched sample methodology and the analysis of total gains used here. The second thing that is readily apparent from the regressions in Tables 3-5A and 3-5B is that the financial condition of neither firm has a significant effect on the CAR's of the selling firm. However, as will be seen shortly, this does not mean that they have no effect on the transaction, a fact that previous research relying on samples of selling firms only would have missed.

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[21] The coefficient for ROAB in the regression on total CAR's is at least negative, although insignificant.

The regression on total gains when those gains are positive (regression (3) of Table 3-5A) reveals that the buyer's interest coverage ratio has a significantly negative effect on total gains while the seller's interest coverage ratio has a significantly positive effect. Thus, the greatest total gains come in those transactions where assets are transferred from firms with high interest coverage to firms with low interest coverage. There is no evidence to support the notion that gains will be greater when buying firms have the financial capacity to make large capital investments in the asset.

Note that none of the financial ratios have a significant effect on total gains when total gains are negative. If one accepts the fact that these transactions are entered into for reasons other than the asset being worth more under the buyer's control than under the seller's, then this is indicative of these reasons (possibly agency related) not varying systematically with the financial characteristics of the firms.

If the interest coverage ratios of the firms affect the total gains to the transaction (at least in synergistic sales), the question remains as to whether they also affect the relative negotiating power of the parties. The regression on buyer CAR's when total gains are positive reveals that the seller's interest coverage has a significantly positive effect (the buyer's own coverage ratio has no significant effect) while the seller's coverage has no significant effect on its own CAR's. Thus, it seems that when engaging in asset sales for synergistic reasons, sellers make better overall deals when they have high interest coverage, but the buyer reaps all of the extra rewards[22]. This result is consistent with financially strong sellers having less bargaining power in synergistic sell-offs. That is, total gains are larger but the seller is unable to negotiate to have any of those gains accrue to it. The is somewhat counter-intuitive; a possible explanation will be discussed in the next section.

Whereas the interest coverage ratio of the seller affects the breakdown of gains for synergistic asset sales and has no significant effect on non-synergistic sales, the opposite is true for the buyer's coverage ratio. The coverage ratio of the buyer has no significant effect on either of the individual firms' CAR's when total gains are positive, but has a significantly negative effect on buyer gains when total gains are negative. For synergistic transactions, it seems that any extra gains associated with lower buyer coverage ratios are divided between the parties to the transaction (i.e. the buyer coverage ratio does not seem to affect negotiating power). In non-synergistic transactions, buyer coverage does not affect total gains but higher coverage is associated with lower returns to the buyer.

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[22] Note that the coefficient on INTCOVS is almost exactly twice as large in the regression on buyer CAR's as it is in the regression on total CAR's. This is consistent with the buyer and seller being of approximately the same size, but the buyer getting all extra gains associated with higher interest coverage of the seller.

One can summarize the observed effects of the interest coverage ratios by stating that the total gains pie is largest when high coverage firms sell to low coverage firms. In synergistic transfers, the buyer's coverage ratio does not affect the division of the pie. However, high coverage ratios for sellers enables the buyer to bargain for a larger slice of this pie. High seller coverage ratios mean that the seller gets a smaller share of a larger pie, meaning no net difference in the gains to the seller. For non-synergistic sell-offs, higher interest coverage for the buyer results in slightly smaller total gains[23], but this is due entirely to a reduction in the size of the buyer's gains. Overall, on either side of the transaction higher coverage ratios seem to be associated with less bargaining power.

These results show the importance of the matched sample/total gains methodology. Looking only at the seller's CAR's, one would conclude that the interest coverage ratio has no effect. However, there is an effect on the transaction as a whole, wherein a seller with high interest coverage has less bargaining power in a transaction with higher overall gains.

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[23] The effect on total CAR's is insignificant in the negative total gains subsample, although the fact that it is "close" to significance (p-value of 14% in a two tail test) and the fact that the coefficient is larger in this subsample than in the positive gains subsample is suggestive of there being some negative effect.

The regressions on buyer CAR's (regression (1) in Tables 3-5A and 3-5B) show that for transactions with positive total gains, buyers with better prior performance do, on average, worse than other buyers. This is evidenced by the fact that both the buyers' return on assets and interest coverage ratio (mentioned previously) have significantly negative effects on buyer returns. Again, the result contradicts the belief that firms will have greater negotiating power if they are more financially sound. The financial characteristics of the selling firm in the transaction also have an effect on the buyer's CAR's when total gains are positive. The coefficient on the seller's interest coverage ratio is significantly positive and the coefficient on the seller's return on assets is significantly negative. While the effect of the coverage ratios has been discussed, the effects of the return on assets of the two firms is somewhat anomalous. Since the coefficient on both firm's ROA is negative, any explanation based on negotiating power would seem to be excluded[24]. Unfortunately, since ROA has a significant effect on neither the total gains nor the seller's gains it is difficult to determine if their influence on buyer CAR's is due to changes in the size of the total gains or on the division of those gains. It would seem that the regressions lack the power to distinguish between the two possibilities conclusively.

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[24] While this paper does not concentrate on signaling explanations, there is a possibility that the effects of the ROA measures is due to some type of signal being released to the market. However, it seems hard to conceive of a signal concerning the value of the buying firm that would be sent by the financial strength of the firm from which it was buying.

When total gains are negative, the financial characteristics of the seller no longer have any effect on the buyer's CAR's. For these transactions it is found that both the buyer's interest coverage ratio and debt/assets ratio have significantly negative effects on buyer CAR's. The fact that the degree of leverage significantly lowers average buyer returns (but leaves seller and total returns unchanged) when the transaction has negative total returns, but has no effect on positive total gains transactions would seem to indicate that markets are wary of highly leveraged buyers spending money on deals the markets deem to be "bad" overall, but do not mind when highly leveraged firms are involved in "good" deals.

B.2. A Possible Interpretation

The results presented above, especially those concerning the interest coverage ratios, raise some interesting questions. Why would the most total gains come when cash-rich firms sell to cash-strapped firms? Why does strong prior performance seem to lead to less bargaining power in negotiations? Both of these results are contrary to commonly held priors.

Consider first the effect of the interest coverage ratios of the firms on the total gains to the transaction. It seems logical that financially strong firms do not need the inflow of capital that occurs when assets are sold. Conversely, financially weak firms may be in need of new sources of funds (because operations are not providing enough cashflow and access to capital markets is limited). Because of this dichotomy, financially strong firms will divest assets only when there exist fairly obvious, and fairly large, potential gains to the transaction. That is, without the pressure that limitations on capital provides, firms choose only to divest in cases where there are large total gains. Thus, the positive relationship between seller interest coverage and total gains can be explained by the relationship between the financial condition of the divesting firm and the type of divestitures that it will tend to be involved in. On the buying side, it is also logical that firms without large amounts of capital (e.g. low coverage ratios) will be limited in their ability to buy assets. Because of this, financially weak firms will only buy assets when there are large potential gains to the transaction. Financially strong buyers have the luxury of being able to use capital in the pursuit of smaller potential gains (although presumably still of positive net present value), while financially weak firms will be constrained from entering the market for assets unless there exist large and obvious synergies. Without the appearance of potentially large gains to a purchase, external capital markets will be unwilling to provide the necessary funding for a purchase of assets

The question that remains is why strong prior performance seems to lead to less bargaining power in negotiations. Again, this is opposite of the assumption that is generally made concerning negotiating power. A possible answer to this question lies in the fact that poor performance may act as an incentive device for management via pressure from external capital markets. Consider selling firms. As discussed in Section II, selling firms that do not "need" to raise capital through asset sales (perhaps to satisfy creditor demands or to meet covenants) do not have the same incentives within negotiations that firms under outside pressure have. These high coverage firms may be willing to take lower prices for assets than they otherwise would, given a higher debt burden. Simply put, the agency problem here is one of shirking in negotiations. Without the discipline that capital market pressure provides, the management of the selling firm does not have the incentive to bargain for more than their reservation price. The same type of logic can hold for firms on the buying side. Buying firms will only complete transactions in which they are able to negotiate a good deal for themselves. Conversely, well performing firms may be willing to pay higher prices than necessary because of the absence of pressure on management. Basically, capital markets do not tend to examine and second-guess the decisions of well-performing firms as much as of poor performers.

One inconsistency in the story of poor performance as an incentive device is that the effect is schizophrenic. Divesting firms' interest coverage ratios affect bargaining power when total gains are positive, but not when they are negative. Buying firm coverage ratios affect bargaining when total gains are negative, but not when they are positive. While this remains an anomaly, one could speculate that transactions with positive total gains tend to be instigated by the seller and transactions with negative gains tend to be initiated by the buying firm. Presumably, buying firms would suggest transactions for which there are no total gains because of some type of agency problem. If some form of agency problem is the motivation for buyers to enter into transactions for which there are no overall gains[25], then these problems may be exacerbated in firms with high interest coverage. Again, a lack of capital market discipline due to strong firm performance would be consistent with findings. However, it must be noted that the schizophrenic of poor performance as an incentive device is anomalous at this point and the explanation given is purely conjectural.

C. A More Direct Examination of Negotiating Power

Because the general conclusions concerning the effects of financial strength, namely that poor prior performance can lead to more discipline being imposed upon managers in negotiations, go against the usual prior assumptions concerning financial strength, a more direct test of the effect of the financial performance on negotiating power is necessary. Towards this end, the first two regressions in each of Tables 3-3, 3-5A and 3-5B were repeated with the level of Total CAR's included on the left hand side as a control variable. By controlling for the level of total gains to the transaction, one is able to determine directly if the effects observed are indeed due to cross-sectional fluctuations in negotiating power. The results of these regressions are presented in Tables 3-6, 3-7A and 3-7B. The results show that, qualitatively, the conclusions derived above do not change. Table 3-6 shows that the puzzling negative effect of both buyer's and seller's ROA on buyer CAR's is present across all transactions (whereas, when not controlling for total CAR's it was observed only for the subsample of positive total gains transactions). As well, while the seller's interest coverage ratio now has only a marginally significant positive effect on buyer CAR's, the degree of seller leverage has a significantly negative effect. Again, the conclusion would seem to be that buyer's have more negotiating power when dealing with financially strong sellers.

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[25] One may argue that some buyers may enter non-synergistic transactions because they are able to transfer wealth from the seller to themselves and it is true that there are buyers in the negative total gains subsample that have themselves received positive gains (of the 183 buyers in negative total gains transactions, 41 have positive CAR's). However, one can further divide the subsample into non-synergistic transactions where the buyer receives positive CAR's (and the seller, by necessity, receives negative gains) and non-synergistic transactions where the buyer receives negative CAR's. Regressing buyer CAR's on INTCOVB in these two smaller subsamples reveals that INTCOVB is significantly negative only when the buyer receives negative CAR's (results not reported). Thus, the basic result for INTCOVB on the negative total gains subsample is not driven by firms with lower interest coverage being more likely to "rip off" selling firms.

When the sample is broken up into positive and negative total gains subsamples and the level of total gains controlled for in the regressions, the results on the financial ratios are again consistent with those presented previously. When total gains are negative, as in Table 3-7B, the results for the financial ratios are identical to those in Table 3-5B. There are, however, some unresolved issues. For instance, while higher buyer interest coverage leads to less negotiating power for the buyer, it is not reflected in a significant impact on the seller's negotiating power. This may be indicative of other parties (such as bondholders) receiving some of the gains to certain transaction, however, an examination of other firm stakeholders would be beyond the scope of this study.

Table 3-5A presents the results on negotiating power when total gains are positive. The only difference between these results and those previously presented in Section V-B is that the buyers interest coverage now has a significantly positive effect on seller CAR's. Thus, there is more evidence that poor prior performance by a firm can impose a type of discipline in negotiations as sellers perform well when negotiating with buyers without strict capital constraints. Unfortunately, the regression on seller CAR's does not reveal the hypothesized negative effect on seller interest coverage on seller negotiating power. Still, given that for positive total gains transactions, higher seller coverage is associated with higher total gains and with (as shown in Table 3-7A, regression (1)) more negotiating power on the part of buyers, the same conclusion would have to be reached.

Overall, when the regressions control for total gains in order to more directly test the effects of financial performance on negotiating power, there are some small changes in the exact quantitative nature of the results, but the qualitative conclusions remain unchanged.

VI - Conclusions

The evidence presented here suggests that the threat of a takeover on a firm, rather than inducing it to make efficiency enhancing changes, prompts it to make divestitures with fewer overall gains. However, the firm on the buying side of these (possibly) takeover motivated sales is the party that suffers the most losses. There exists weak evidence that this is due to increased competition among buyers following takeover threats on divesting firms.

The financial characteristics of the buying and selling firm were also examined to determine if they had an effect on the transaction. There is no evidence that firms of greater financial strength have more bargaining power. The evidence presented shows that higher interest coverage ratios lead to lower bargaining power for sellers in synergistic sell-offs and for buyers in non-synergistic sell-offs. The general tone of the findings seem to suggest that well performing firms, rather than being able to being able to negotiate from a position of strength, actually have less bargaining power, possibly because of an absence of capital market pressure on managers.

There is no evidence that the most synergies come when poorly performing firms sell assets to firms performing well, thus transferring assets to firms better able to run them. Conversely, there is evidence that, at least for synergistic sell-offs, the most gains come when assets are transferred from firms with loose capital constraints to firms with tighter constraints. The explanation given for this is that divesting firms with loose capital constraints choose to only divest assets when there exist large potential gains, while buying firms with tight capital constraints are only able to raise funding for purchases of assets when there exist large total gains.

Perhaps the most important conclusion to be taken from the results presented here is that there are insights to be gained by observing both the buyer and the seller to a transaction, as well as their combined gain. The results here show that the characteristics of the seller have an effect on the returns to the buyer. As well, the characteristics of both firms have effects on the total gains to the transaction. Looking at only one or the other of the involved firms is simply leaving out half of the story.

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Figure 3-1

Cumulative Abnormal Returns Pre- and Post-Event

Market adjusted returns for buying and selling firms involved in a sample of 424 asset sales between 1982 and 1991. The abnormal returns are cumulated from 250 days before the initial announcement of the sale up to 50 days after the initial annoucement.

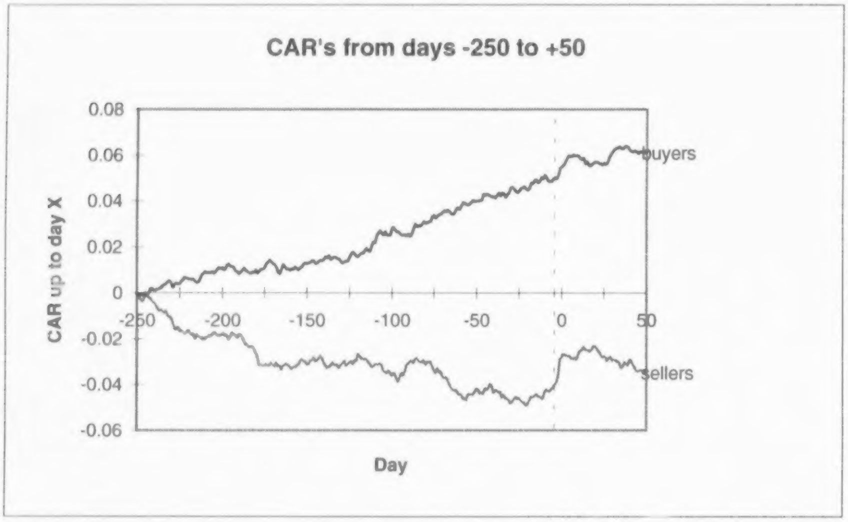

Table 3-1
Financial Characteristics

Financial characteristics of the buying and selling firms involved in 424 asset sales between 1982 and 1991. Figures are obtained from COMPUSTAT when available and from the financial statements of the firm when it is not listed on COMPUSTAT. Only 422 buying firms and 416 selling firms are included because of missing financial data. The calculation of interest coverage does not include firms reporting interest expense of zero (1 seller, 7 buyers). The first two columns of the table contain cross-sectional averages (medians are in round brackets) for various financial characteristics of the buying and selling firms. The third column contains the p-value for a two-tail t-test of equality of means (the two tail p-value for equality of medians from a Wilcoxon Rank Sum test is in round brackets).

	Buyers	Sellers	Test for Difference
Book Assets[a]	6614.943	5804.094	0.4786
	(1462.109)	(2399.355)	(0.0001)
Book Equity[a]	1836.124	1967.527	0.6245
	(643.275)	(851.097)	(0.0090)
Market Equity[a]	2951.511	2921.734	0.9973
	(988.109)	(1157.831)	(0.6826)
Income Before	255.046	227.782	0.4666
Extraordinary Items[a]	(75.130)	(76.700)	(0.1397)
Income/Assets	0.056847	0.035355	0.0001
	(0.051152)	(0.041996)	(0.0001)
Debt/ Assets	0.211645	0.232985	0.0336
	(0.194546)	(0.209309)	(0.0320)
Interest Coverage Ratio	10.2173	5.3214	0.0042
	(4.2951)	(3.4879)	(0.0001)

[a] Figures are given in millions of dollars.

Table 3-2
Effect of Takeover Threats

Effect of a takeover threat or institution of a takeover defense by the buyer or the seller from a sample of 424 asset sales between 1982 and 1991. A firm is considered to have been under a takeover threat if the Wall Street Journal reported a threat on the firm or rumour of takeover threat in the year prior to the asset sale. Firms were considered to have instituted a new takeover defense if the Wall Street Journal reported such an institution in the year prior to the sale. Cumulative abnormal returns are based on market adjusted returns cumulated from days -2 to 0. Each cell contains the mean value if the condition is true, the mean value if the condition is false, the p-value for a (two-tail) t-test of equality of the means and the p-value for a (two-tail) Wilcoxon Rank Sum test of equality of the medians (not reported). All means are in decimal form.

	Threat on Seller -if true -if false (p-value means) [p-value medians]	Threat on Buyer -if true -if false (p-value means) [p-value medians]	Defense by Seller -if true -if false (p-value means) [p-value medians]	Defense by Buyer -if true -if false (p-value means) [p-value medians]
Seller CAR's	0.0052	0.0090*	0.0066	0.0080*
	0.0117***	0.0111***	0.0115***	0.0112***
	(0.4456)	(0.7910)	(0.4526)	(0.6806)
	[0.1242]	[0.7696]	[0.7639]	[0.8637]
Buyer CAR's	-0.0107*	0.0000	0.0088*	-0.0022
	0.0073***	0.0056***	0.0051**	0.0059***
	(0.0061)	(0.7379)	(0.3805)	(0.3493)
	[0.0145]	[0.8478]	[0.1759]	[0.1508]
Total CAR's	-0.0083**	0.0107**	0.0063*	-0.0007
	0.0059***	0.0042***	0.0042***	0.0047***
	(0.0016)	(0.3597)	(0.6700)	(0.3597)
	[0.0034]	[0.2683]	[0.5550]	[0.2683]

Note: * indicates that the mean is significantly different from zero at a 10% level.
** indicates that the mean is significantly different from zero at a 5% level.
*** indicates that the mean is significantly different from zero at a 1% level.

Table 3-3

Regressions of CAR's on Financial Characteristics and Dummy for Takeover Threat

Results of regressions for three different types of cumulative abnormal returns. Buyer and Seller CAR's are the cumulative abnormal returns for the buyer and seller in an asset sale, calculated from cumulating market adjusted returns over the days -2 to 0. Total CAR's are a market weighted average of buyer and seller CAR's. Regressions are run across a sample of 406 transactions out of an initial sample of 424. Transactions were deleted if financial data for either the buyer or the seller was not available or if one of the firms reported interest expense of zero. Parentheses contain the p-values (two tail) for t-tests of the coefficient equaling zero. All t-statistics are calculated using White's Heteroskedasticity Consistent Covariance Matrix. Regressions (1) and (2) also included (not reported) the log of the market value of equity of the buyer and seller respectively.

Dependent Variable	(1) Buyer CAR's	(2) Seller CAR's	(3) Total CAR's
Constant	0.06056	0.00166	0.01879
	(0.030)	(0.970)	(0.450)
TOOFFERS	-0.01339	-0.00795	-0.01334
	(0.060)	(0.338)	(0.000)
PROGS	-0.00166	-0.00436	-0.00375
	(0.688)	(0.404)	(0.214)
PROGB	0.00017	0.00296	0.00227
	(0.972)	(0.600)	(0.502)
ROAB	-0.12265	0.02220	-0.03305
	(0.046)	(0.696)	(0.348)
INTCOVB	-0.00004	0.00003	-0.00002
	(0.402)	(0.610)	(0.514)
DAB	-0.01862	-0.01322	-0.00844
	(0.206)	(0.414)	(0.404)
ROAS	-0.04179	0.00931	0.02077
	(0.358)	(0.854)	(0.538)
INTCOVS	0.00027	0.00007	0.00012
	(0.028)	(0.684)	(0.192)
DAS	-0.01709	0.03709	0.00610
	(0.226)	(0.270)	(0.570)
SIZEB	0.02703	0.00669	
	(0.014)	(0.454)	
SIZES	-0.02990	0.11452	
	(0.070)	(0.010)	
SIZET			0.07501
			(0.094)
Sample Size	406	406	406
Adj. R^2	0.070	0.064	0.022

Table 3-4
Regressions of Buyer CAR's on Seller CAR's

Regressions of buying firm CAR's on selling firm CAR's (p-values for tests of the estimated coefficients being significantly different from zero are in parentheses). Total gains are calculated by taking a market weighted average of the three day market adjusted CAR's to the buying and selling firm in each transaction. The sample is then divided based on whether the total gain is positive or negative.

A. Sample of transactions with positive total gains.

$$\text{Buyer CAR's} = \underset{(0.000)}{0.021192} + \underset{(0.774)}{0.013518} \text{ (Seller CAR's)}$$

B. Sample of transactions with negative total gains.

$$\text{Buyer CAR's} = \underset{(0.000)}{-0.016780} - \underset{(0.000)}{0.20744} \text{ (Seller CAR's)}$$

Table 3-5A
Regressions when Total Gains are Positive

Results of regressions for the three different types of CAR's on the subsample of transactions for which the total gains are positive. Buyer and Seller CAR's are the cumulative abnormal returns for the buyer and seller in an asset sale, calculated from cumulating market adjusted returns over the days -2 to 0. Total CAR's are a market weighted average of buyer and seller CAR's. Transactions were excluded Total CAR for the transaction was negative, if financial data for either the buyer or the seller was not available or if one of the firms reported interest expense of zero. Parentheses contain the p-values (two tail) for t-tests of the coefficient equaling zero. All t-statistics are calculated using White's Heteroskedasticity Consistent Covariance Matrix. Total CAR's are a market-weighted average of the buyer and seller CAR's. Regressions (1) and (2) also included (not reported) the log of the market value of equity of the buyer and seller respectively.

Dependent Variable	(1) Buyer CAR's	(2) Seller CAR's	(3) Total CAR's
Constant	0.05011	-0.10104	0.02463
	(0.154)	(0.094)	(0.340)
TOOFFERS	-0.01170	0.00406	-0.01127
	(0.290)	(0.760)	(0.000)
PROGS	0.002216	-0.00141	-0.00154
	(0.690)	(0.854)	(0.636)
PROGB	0.00274	0.00541	0.00280
	(0.652)	(0.458)	(0.448)
ROAB	-0.14919	0.00072	-0.02212
	(0.030)	(0.990)	(0.456)
INTCOVB	-0.00002	0.00002	-0.00004
	(0.724)	(0.700)	(0.078)
DAB	0.00360	0.01397	0.00422
	(0.862)	(0.578)	(0.680)
ROAS	-0.13261	-0.00534	-0.01955
	(0.004)	(0.952)	(0.522)
INTCOVS	0.00025	0.00011	0.00012
	(0.004)	(0.450)	(0.026)
DAS	-0.02374	0.05974	0.00702
	(0.240)	(0.232)	(0.522)
SIZEB	0.01894	-0.00458	
	(0.110)	(0.656)	
SIZES	-0.01785	0.23727	
	(0.472)	(0.000)	
SIZET			0.08820
			(0.090)
Sample Size	223	223	223
Adj. R^2	0.062	0.156	0.027

Table 3-5B
Regressions when Total Gains are Negative

Results of regressions for the three different types of CAR's on the subsample of transactions for which the total gains are negative. Buyer and Seller CAR's are the cumulative abnormal returns for the buyer and seller in an asset sale, calculated from cumulating market adjusted returns over the days -2 to 0. Total CAR's are a market weighted average of buyer and seller CAR's. Transactions were excluded Total CAR for the transaction was positive, if financial data for either the buyer or the seller was not available or if one of the firms reported interest expense of zero. Parentheses contain the p-values (two tail) for t-tests of the coefficient equaling zero. All t-statistics are calculated using White's Heteroskedasticity Consistent Covariance Matrix. Total CAR's are a market-weighted average of the buyer and seller CAR's. Regressions (1) and (2) also included (not reported) the log of the market value of equity of the buyer and seller respectively.

Dependent Variable	(1) Buyer CAR's	(2) Seller CAR's	(3) Total CAR's
Constant	0.02991	0.07379	-0.04439
	(0.378)	(0.180)	(0.054)
TOOFFERS	-0.00829	-0.01395	-0.00656
	(0.248)	(0.064)	(0.104)
PROGS	0.00122	-0.00007	0.00054
	(0.768)	(0.988)	(0.800)
PROGB	-0.00006	0.00615	0.00326
	(0.990)	(0.372)	(0.146)
ROAB	-0.08064	0.04614	-0.04646
	(0.282)	(0.550)	(0.294)
INTCOVB	-0.00022	0.00001	-0.00009
	(0.002)	(0.966)	(0.140)
DAB	-0.03874	-0.02707	-0.01330
	(0.008)	(0.112)	(0.138)
ROAS	0.05295	0.6877	0.05147
	(0.324)	(0.234)	(0.142)
INTCOVS	0.00042	-0.00069	-0.00018
	(0.532)	(0.180)	(0.360)
DAS	0.00364	-0.01220	0.00777
	(0.770)	(0.608)	(0.322)
SIZEB	0.04197	-0.01585	
	(0.058)	(0.268)	
SIZES	-0.03674	0.46112	
	(0.030)	(0.268)	
SIZET			0.01761
			(0.580)
Sample Size	183	183	183
Adj. R^2	0.096	0.045	0.048

Table 3-6

Regressions of CAR's on Financial Characteristics and Dummy for Takeover Threat when Controlling for Total Gains

Results of regressions for buyer and seller CAR's, where total CAR's are controlled for in the regressions. Buyer and Seller CAR's are the cumulative abnormal returns for the buyer and seller in an asset sale, calculated from cumulating market adjusted returns over the days -2 to 0. Total CAR's are a market weighted average of buyer and seller CAR's. Regressions are run across a sample of 406 transactions out of an initial sample of 424. Transactions were deleted if financial data for either the buyer or the seller was not available or if one of the firms reported interest expense of zero. Parentheses contain the p-values (two tail) for t-tests of the coefficient equaling zero. All t-statistics are calculated using White's Heteroskedasticity Consistent Covariance Matrix. Regressions (1) and (2) also included (not reported) the log of the market value of equity of the buyer and seller respectively.

Dependent Variable	(1) Buyer CAR's	(2) Seller CAR's
Constant	0.04882	-0.01639
	(0.030)	(0.686)
TOOFFERS	-0.00378	0.00461
	(0.512)	(0.526)
PROGS	0.00271	0.00093
	(0.416)	(0.824)
PROGB	-0.00147	0.00132
	(0.688)	(0.778)
ROAB	-0.09361	0.06170
	(0.052)	(0.156)
INTCOVB	-0.00002	0.00005
	(0.508)	(0.310)
DAB	-0.01179	-0.00599
	(0.348)	(0.640)
ROAS	-0.05160	-0.00750
	(0.058)	(0.884)
INTCOVS	0.00018	-0.00005
	(0.158)	(0.688)
DAS	-0.02384	0.02972
	(0.028)	(0.298)
Total CAR	0.81315	1.0294
	(0.000)	(0.000)
SIZEB	0.01397	-0.01118
	(0.124)	(0.068)
SIZES	-0.02655	0.12145
	(0.040)	(0.004)
Sample Size	406	406
Adj. R^2	0.3738	0.3536

Table 3-7A
Regressions Controlling for Total Gains when Total Gains are Positive

Results of regressions for buyer and seller CAR's on the subsample of transactions for which the total gains are positive, where the regressions control for the size of the total gains to the transaction. Buyer and Seller CAR's are the cumulative abnormal returns for the buyer and seller in an asset sale, calculated from cumulating market adjusted returns over the days -2 to 0. Total CAR's are a market weighted average of buyer and seller CAR's. Transactions were excluded Total CAR for the transaction was negative, if financial data for either the buyer or the seller was not available or if one of the firms reported interest expense of zero. Parentheses contain the p-values (two tail) for t-tests of the coefficient equaling zero. All t-statistics are calculated using White's Heteroskedasticity Consistent Covariance Matrix. Total CAR's are a market-weighted average of the buyer and seller CAR's. Regressions (1) and (2) also included (not reported) the log of the market value of equity of the buyer and seller respectively.

Dependent Variable	(1) Buyer CAR's	(2) Seller CAR's
Constant	0.03569	-0.14246
	(0.250)	(0.008)
TOOFFERS	-0.00368	0.01932
	(0.718)	(0.136)
PROGS	0.00403	0.00157
	(0.430)	(0.802)
PROGB	0.00115	0.00257
	(0.840)	(0.654)
ROAB	-0.12822	0.03893
	(0.032)	(0.410)
INTCOVB	0.00001	0.00006
	(0.790)	(0.090)
DAB	-0.00089	0.00511
	(0.790)	(0.802)
ROAS	-0.11186	0.02970
	(0.002)	(0.656)
INTCOVS	0.00016	-0.00006
	(0.052)	(0.646)
DAS	-0.02888	0.05107
	(0.110)	(0.248)
Total CAR	0.72432	1.3776
	(0.000)	(0.000)
SIZEB	0.01130	-0.01959
	(0.232)	(0.026)
SIZES	-0.02980	0.21750
	(0.246)	(0.004)
Sample Size	223	223
Adj. R^2	0.2181	0.4376

Table 3-7B

Regressions Controlling for Total Gains when Total Gains are Negative

Results of regressions for buyer and seller CAR's on the subsample of transactions for which the total gains are negative, where the regressions control for the size of total gins to the transaction. Buyer and Seller CAR's are the cumulative abnormal returns for the buyer and seller in an asset sale, calculated from cumulating market adjusted returns over the days -2 to 0. Total CAR's are a market weighted average of buyer and seller CAR's. Transactions were excluded Total CAR for the transaction was positive, if financial data for either the buyer or the seller was not available or if one of the firms reported interest expense of zero. Parentheses contain the p-values (two tail) for t-tests of the coefficient equaling zero. All t-statistics are calculated using White's Heteroskedasticity Consistent Covariance Matrix. Total CAR's are a market-weighted average of the buyer and seller CAR's. Regressions (1) and (2) also included (not reported) the log of the market value of equity of the buyer and seller respectively.

Dependent Variable	(1) Buyer CAR's	(2) Seller CAR's
Constant	0.05943	0.09182
	(0.076)	(0.110)
TOOFFERS	-0.00348	-0.01026
	(0.564)	(0.156)
PROGS	0.00086	-0.00028
	(0.830)	(0.950)
PROGB	-0.00218	0.00381
	(0.618)	(0.578)
ROAB	-0.04465	0.07139
	(0.456)	(0.370)
INTCOVB	-0.00015	0.00007
	(0.032)	(0.728)
DAB	-0.02943	-0.01744
	(0.048)	(0.264)
ROAS	0.01140	0.03455
	(0.798)	(0.590)
INTCOVS	0.00058	-0.00055
	(0.378)	(0.272)
DAS	-0.00141	-0.01737
	(0.902)	(0.460)
Total CAR	0.72665	0.62834
	(0.000)	(0.000)
SIZEB	0.03611	-0.01765
	(0.096)	(0.146)
SIZES	-0.03206	0.04715
	(0.012)	(0.264)
Sample Size	183	183
Adj. R^2	0.2314	0.1053

Chapter 4

Creditor Pressure and Asset Sales: Do Buyers Benefit?

I - Introduction

Sales of assets to other firms has proven to be a popular method for firms to divest themselves of business units. Past research has shown these asset sales to be, on average, wealth increasing for the shareholders of the divesting firm[1]. Because asset sales provide the firm with an inflow of capital, attention has lately focused on whether the particular use to which the proceeds of a sale are put can help explain the cross-sectional variation in stock price changes on the announcement of a sale.

There are several (not necessarily mutually exclusive) hypotheses about the way the use of proceeds may affect stock market reaction to an asset sale. These hypotheses can be grouped into three main types: avoidance of financial distress, agency considerations, and signaling.

The capital raised through asset sales may help a firm to avoid the costs associated with financial distress. As Shleifer and Vishny [1992] point out, asset sales can be a rational alternative to other forms of capital acquisition, especially if the firm is subject to the informational asymmetries of Myers and Majluf [1984]. Firms facing potential distress are most likely to use the proceeds of a divestiture to reduce their degree of leverage. Thus, this hypothesis implies that firms using the proceeds of an asset sale to reduce debt will do particularly well if this reduces the probability of the future distress. On the other hand, firms which are highly levered may be subject to creditor pressure to sell assets in order to pay down their debt. This pressure may result in the firm selling assets quickly or at an inopportune time and thereby realizing a lower price than it otherwise might have. Yeung and Sundaram [1994], for instance, state that under pressure from creditors management may respond "by selling off valuable assets at less-than-optimal prices, or by engaging in fire sales to stave off creditors". Donaldson [1990] notes that when confronted with "the unrelenting pressure of a highly leveraged capital structure, companies can and do divest hundreds of millions of dollars of going-concern value. But a fire sale puts the vendor in an impossible bargaining position." However, pressure from creditors can also act as a disciplining device on management if it forces them to make value enhancing divestitures that they otherwise would not. One would expect creditor pressure to be most prevalent when firms choose to repay debt with the proceeds of a sale. Note that, just as with debt markets, management may be pressured to sell assets by the equity markets; specifically if the firm is under a takeover threat and therefore needs cash in order to fight the threat or is attempting to sell off the assets which make it an attractive target. This type of pressure is most likely to be present when a firm uses the proceeds of a sale to repurchase its own stock (as this is often associated with a takeover threat).

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[1] See, for example, John and Ofek [1995], Lang Poulsen and Stulz [1995], Klein [1986] and Rosenfeld [1984], among others .

Agency theory hypotheses can have conflicting implications for the stock price effect of asset sales depending on which hypothesis dominates. Using the proceeds of a sale to reduce debt will decrease firm leverage and therefore has the potential to raise the level of agency problems in the firm (Jensen [1986]). Brown, James and Mooradian [1994] suggest that managers may choose to sell assets and pay down debt in order to preserve their control position by keeping creditors happy. Conversely, if the proceeds are kept within the firm and used for re-investment, these proceeds may be discounted by the market because of the possibility that they will be used in negative net present value projects. As discussed in Lang, Poulsen and Stulz [1995], this "financing hypothesis" means, in effect, that the markets will be suspicious of sales which may have been conducted in order to create free cash flow and fund projects valuable to management (but not necessarily to shareholders).

Signaling hypotheses regarding the effect of asset sales on firm value are varied, some with positive effects for firm value and others with negative effects. First, if the proceeds of a sale are used to either repurchase stock or to repay debt, then a change in the capital structure of the firm is effected. By Ross [1977], changes in capital structure can signal management's information concerning the future prospects of the firm. Second, using proceeds to repurchase the stock of the firm may signal that management believes its equity to be undervalued in the market (see Smith [1986] for evidence on the effect of stock repurchases outside of asset sales, as well as other capital acquisition effects). Third, a decision to re-invest the proceeds of the sale could be seen by the market as a positive signal about the firm's investment opportunity set. Conversely, retaining the proceeds within the firm could also be taken as a negative signal if the market interprets this as a sign that future earnings will be lower than expected, and therefore the firm needs new sources of funds (see Smith [1986] for a discussion). The same signal could also be sent by repaying debt if the market takes this to mean that the firm is in worse financial shape than previously thought and is trying to pay down debt in order to avoid distress.

The previous evidence on the effect of the use of proceeds of an asset sale is mixed. Lang, Poulsen and Stulz [1995] classify divesting firms by whether they re-invest the proceeds within the firm or pay them out of the firm (either to reduce debt or repurchase stock). They find that the abnormal returns for the re-investment sample are significantly lower than for the payout sample (in fact, the abnormal returns in the re-invest category are insignificant while those in the payout sample are significantly positive). They take this as evidence in support of their hypothesis that firms divest in order to fund other activities and that the market discounts the proceeds of sales when the firm retains them due to the possibility that management will invest in projects that are not value maximizing. Mayers and Singh [1992] look at the abnormal returns upon the announcement of divestiture *programs* and classify them by whether the proceeds were used to re-invest, repay debt or repurchase stock. Mayers and Singh find that programs announced for the purpose of repurchasing stock are associated with large (9.52%), significant abnormal returns. The abnormal returns are lower (1.78%, significant) when the firm re-invests the proceeds and are significantly negative (-2.06%) when the firm repays debt. Brown, James and Mooradian [1994] examine a sample of financially distressed firms announcing asset sales and find that those firms using the proceeds to repay debt generate significantly lower abnormal returns than those firms retaining the proceeds. Brown et al. conclude that creditors exhibit significant influence in asset sale decisions involving distressed firms. Finally, Yeung and Sundaram [1994] also examine the role of creditor influence, although they do not specifically look at differences over stated uses of proceeds. They find that firms with higher debt-equity ratios[2] (and thus presumably the most susceptible to creditor influence) receive significantly lower abnormal returns upon announcement of asset sales. However, this significance holds only for the sub-sample of firms experiencing negative stock market reactions to the announcement. The implication is that when, and only when, the market believes the sale to be a poor move on the part of the seller, it takes into account the level of debt and therefore creditor influence. Yeung and Sundaram also find that, ex post, those firms which initially had negative market reactions exhibit decreases in their degree of leverage and decreases in their dividend payout ratios. They conclude that this is consistent with these "bad news" divestitures having been conducted in order to satisfy creditors and repay debt.

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[2] Yeung and Sundaram also find that lower previous rates of growth in cashflows and sales and higher
R & D expenses are associated with lower abnormal returns.

This research concerns itself with the existence of pressure to sell assets on divesting firms[3]. In particular, we are interested in whether firms buying divested assets gain from negotiating with pressured sellers through the ability to negotiate for lower prices. The specific purpose is really three fold: (1) to determine if there exists pressure on certain sellers and if this pressure results in lower returns for divesting firms, (2) determine if the buying firm in the transaction can expect to benefit from the existence of pressure on the seller, and (3) determine if the observed effects on the buying firm can help clarify the effects on the selling firm. The overall goal is to determine if the use to which the proceeds of an asset sale are put has an effect on the manner in which the sale itself is conducted, as opposed to having "secondary" effects on the divesting firm such as signaling information or agency problems to the market.

Pressure on management to sell assets may cause them to get a lower price than they might otherwise because (i) they are not able/willing to take the time necessary to find the buyer offering the highest price or (ii) because they are forced to sell into an illiquid market (as per Shleifer and Vishny [1992]). Under (i), buyers are able to use the pressure on the selling firm to their advantage in price negotiations and therefore should expect to derive larger gains from the transaction. Under (ii), pressured sellers are forced to sell at inopportune times. For instance, they may be forced to sell assets when the value of those assets to alternative owners is low (possibly because of an economic downturn), or when the firm with the highest valuation on the assets is not in the market[4]. Note that the seller will be, on average, worse off because of the pressure in this scenario because it is forced to sell assets at a time that it would rather not. However, the buyer of these assets does not gain as it is paying a "fair" price given current market conditions. It is simply the case that this fair price is less than the seller could get if it could wait for a more liquid asset market. If pressure does affect firms' divestiture decisions and if (i) is a relatively common result, one would expect buyers to receive, on average, larger gains when buying from a pressured seller. Unfortunately, previous research has not looked at the effect of the use of proceeds on the buying firm.

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[3] Note that pressure to sell assets may come from creditors, the equity market or from management itself if management requires cash in order to fund projects valuable to itself.

It is hoped that by looking at the effect on the buying side of the transaction, more clarity can be brought to the picture on the selling side.

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[4] Shleifer and Vishny [1992] point out that this will tend to happen when the industry is going through a downturn. In an industry downturn, other firms in the same industry as the divesting firm (who presumably are best able to use the assets and therefore have the highest valuation of them) will not have the necessary capital to buy assets. Thus, the divesting firm is forced to sell to a buyer outside the industry for a price less than the value in best use.

Lang et al. point out in their paper that "the information conveyed by asset sales is difficult to evaluate because asset sales convey news about the value of the asset sold, the intended use of the proceeds and, possibly, the firm's financial health" (pg. 22). Thus, it is hard to draw conclusions about how a particular use of proceeds might affect an asset sale by looking at sellers' returns. The returns of buyers, however, are not subject to any of the noise inducing factors that Lang et al. list. The use of proceeds itself (independent of its relation to an asset sale) may directly affect the seller's stock price but will not affect the buyer. The financial health of a seller can also be signaled by an asset sale, either negatively or positively. Again, the buying firm is not subject to these signals. Finally, the value of the asset itself may be signaled by its sale, however, this should not have any effect on the buying firm. The value of the asset may be signaled by the price paid for the asset, but since the buying firm is paying this price no change in the stock price should result for the buyer from a signal of asset value. For example, an asset may currently be valued at $1 by the market but actually be worth $2. The current owner can signal its true value by selling the asset for $2. This results in a positive effect for the stock of the seller as an asset the market thought was worth $1 has been replaced by $2 in cash. However, for the buyer of this asset, $2 in cash has been paid for an asset now known by the market to be worth $2.

The problem is approached through the use of a sample of asset sale transactions in which both the buyer and the seller are known and have information available. In this way, not only can the abnormal returns to the divesting firm on announcement of the sale be examined to see if they vary across different stated uses of proceeds, but buyer abnormal returns can also be examined. The transactions are then classified by the announced use(s) of the proceeds by the seller. The classifications used are: re-invest in the firm, repay debt and repurchase stock.

The basic results provide some evidence that divesting firms which re-invest the proceeds of the sale do better than firms which use the proceeds to pay back debt. This is consistent with the hypothesis that creditors can put pressure on firms to sell and that these pressured firms fare worse in sell-offs. However, there is no evidence that buyers in these debt reducing divestitures do any better than other buyers. Thus, the lower seller gains do not seem to be the result of the divesting firm having to sell assets at bargain prices. Rather, it seems that pressure manifests itself through forcing sales of assets into markets in which the value to alternative users is low. On a practical level, the results indicate that if a firm wishes to expand through the purchase of assets, there is little point in finding debt laden firms from which to buy.

The rest of the paper is organized as follows: Section II details the sample and methodology, Section III presents the results of the analysis and Section IV presents some brief conclusions.

II - Sample and Methodology

The initial sample consists of all of the voluntary sell-offs announced in *Mergers and Acquisitions* between 1982 and 1991, inclusive. Sales of assets classified as having SIC codes between 60 and 64 were excluded because of the regulatory environment. Also excluded were those sales for which no announcement was made in the Wall Street Journal (WSJ). The day of the first announcement of the sale was taken as the event date for the selling firm, while the first mention in the WSJ of the buyer was taken as the event date for the buying firm[5]. Transactions were excluded if there were other WSJ announcements for either firm in the two days preceding the event date. Sales were omitted if their event dates were after the effective date of the sale as given in *Mergers and Acquisitions* (indicating that the sale may have been public knowledge before the WSJ announcement), if the selling firm was in bankruptcy or very recently emerged from bankruptcy (so as to concentrate on purely voluntary divestitures), and also if the firm stopped trading before the effective date of the transaction. Only those transactions for which *both* buyer and seller were listed on NYSE or AMEX and had returns available on the CRSP files were kept. Lastly, to be included in the final sample, a price paid for the asset had to be available from either the WSJ or *Mergers and Acquisitions* and this price had to be greater than or equal to ten percent of the market value of the divesting firm's common stock. The reason for concentrating on large transactions such as these is to, first, ensure that the stock price effects will be large so as to facilitate the study of the variation across uses of proceeds, and also because these sales are the most likely to be directly associated with the use of proceeds. That is, if a multi-billion dollar company sells an asset for $10 million and uses the proceeds to repay debt, one may think that the decision on the use of the proceeds may be somewhat coincidental; however, if a firm sells assets worth ten percent of its equity market value, it is more likely that the sale was conducted specifically to raise funds for a certain purpose.

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[5] Therefore, for a single transaction it is possible to have different event dates for buyer and seller. This will occur if the seller initially announces its desire to sell the asset, but does not yet have a buyer or if it announces plans to sell the asset to an as yet unnamed buyer.

The sample consists of 141 asset sales, two of which were deleted because they were sale-and-leaseback transactions, leaving 139 sales. The sellers in each of the transactions were classified by their announced intention for the proceeds of the sale. The classifications used were: re-investment in the firm, repayment of debt and repurchase of stock. Firms were classified by whether any of the proceeds were to be used in these ways so that one divesting firm may fall in more than one category if multiple uses were announced. The announced uses were gathered from WSJ article announcement or the annual report of the selling firm[6,7].

Financial data for the firms in the sample was collected from COMPUSTAT for the year prior to the announcement of the divestiture, or, if data was unavailable there, from the annual report of the firm. Note that financial data for some (4 selling firms, 1 buying firm) firms could not be located from either source. These firms were included in the event study, but were excluded from the statistics on financial characteristics.

The gains to each firm in the transaction were estimated using cumulative abnormal returns (CAR's) based on market adjusted returns. Let R_{it} be the return to firm i on date t and R_{mt} be the return to the CRSP equally weighted index on date t. The abnormal return for firm i on date t is defined as $AR_{it}=R_{it}-R_{Mt}$. The day of the initial announcement of the asset sale was taken as the event date, t=0, for the seller and for the buyer if known at that time. If the future buyer of the asset was not yet known when the seller first announced its intention to sell, then the date of the first mention of the buyer

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[6] The NEXIS database was used to search the 8K filings of the divesting firms (for transactions after 1985, as NEXIS only contains filings back to 1985), however this did not uncover any uses of proceeds that were not known from other sources.

[7] The uses of proceeds gathered from annual reports may not have been known at the time of the public announcement and therefore would not necessarily have an influence on the abnormal returns for the selling firm (unless one assumes foresight on the part of the market). However, as the basic purpose of this research is to determine if the use of proceeds has an actual effect on the way in which the sale is conducted, rather than simply signaling information, this is not of primary importance. Note also that there is no a priori reason to expect the buying firm to be affected by the *announcement* of the use of proceeds (the hypothesis is that the use itself may affect the buying firm's returns because it is symptomatic of pressure on the selling firm, and this would hold irrespective of whether the market knows the use or not), and therefore the potential time lag between the date of the asset sale and the updating of the market's information set to include the use of proceeds does not seem to be crucial to this study.

was taken as the event date for the buying firm. CAR's were calculated by summing abnormal returns from dates t=-2 to t=0. A three day window was chosen for analysis as this would include the actual event date as well as days in which there may have been prior information leakage concerning the sale. Tests of the significance of mean CAR's were conducted via the standard event study methodology (see Brown and Warner [1980,1985] for details). Wilcoxon Sign Rank tests were employed to test the significance of medians. Differences in abnormal returns in various sub-samples were tested for significance using standard t-tests on the means of two random samples and Wilcoxon Rank-Sum tests on the medians.

III - Results and Discussion

Of the 139 divesting firms in the sample, 73 used a significant portion of the proceeds to repay debt, 20 used some of the proceeds to repurchase stock[8] and 46 re-invested in the firm. There were 23 firms for which no use of proceeds could be determined.

Table 4-1 shows some basic characteristics of the buyers and sellers in the sample. It is apparent that the buying firms tend to be larger (both by book assets and market value of common stock) and have had better prior performance than the selling firms (measured both by Income/Book Assets and by the interest coverage ratio). Selling firms are also more highly levered than the buyers.

Panel A of table 4-2 compares the financial characteristics of sellers over different announced uses of proceeds. Although both means and medians are reported, the discussion will centre on medians because of the skewness of the distributions. Between the repurchase stock sample and the re-investment sample there are few differences other than sellers who repurchase their own stock having a larger market value of equity in the median (significantly different at a 5% level). However, there are significant differences between those firms choosing to repay debt and the other classes. The interest coverage ratios of the repay debt firms are significantly lower than the other classifications. The Income/Assets ratio is also significantly lower in the median as compared to the other firms (and significantly lower in the mean when compared to the firms repurchasing stock). The Debt/Assets ratio is significantly higher for firms repaying debt when compared to either of the other types of firms. In summary, the picture that emerges is that, while firms re-investing and repurchasing stock are similar to one another, firms choosing to use asset sale proceeds to repay debt are more highly levered, less profitable and less able to meet their debt obligations than are other divesting firms. This is consistent with the idea that those firms repaying debt may be subject to greater creditor pressure.

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[8] One of these firms actually paid out the proceeds as a special dividend.

Lang, Poulsen and Stulz [1995] classify firms repaying debt and firms repurchasing stock as "payout" firms, because they do not retain the proceeds[9]. The findings presented here indicate that these types of firms are substantially different and therefore may have very different motivations for divesting. The rationale for keeping these classes separated in this research would seem to be justified.

Panel B of table 4-2 compares the characteristics of buying firms over different uses of proceeds of the seller. As would be expected, there are few significant differences. Firms buying from sellers which use the proceeds to repurchase stock have significantly lower return on assets than the other buyers, but this one significant difference out of eighteen possible is consistent with expected rejection rates under the null of equality.

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[9] Note, however, the Lang et al. have very few cases of firms repurchasing stock in their sample and therefore it would be difficult to separate the groups in that case.

Table's 4-1 and 4-2 indicate that the sample used here is somewhat different than the sample of Lang, Poulsen and Stulz. Lang et al. have a much larger difference between the mean interest coverage ratio of the firms re-investing the proceeds (27.04) and those paying the proceeds out of the firm (0.98). Also, the Lang et al. sample has an overall average return on assets that is negative, whereas the sample used here has an positive overall average ROA, and ROA is also positive on average for all three uses of proceeds. Lang, Poulsen and Stulz rely on 8K filings for their sample and this may lead to some bias towards inclusion of firms undergoing major restructurings as firms conducting assets sales in the "ordinary course of business" are not required to file an 8K. Firms in a major restructuring are more likely to be those in significant financial difficulty. This may help explain the differences in the two samples. The sample presented here is comparable on a general basis with the sample of Mayers and Singh as in their sample the firms choosing to repay debt exhibit significantly higher leverage and significantly lower profit margins than firms using proceeds differently.

The results of the initial event study are contained in Table 4-3 (again, both means and medians are presented although the discussion will centre on the medians). Over the whole sample, sellers have significantly positive mean (2.2%) and median (0.8%) abnormal returns. Buyer abnormal returns, however, are insignificantly different from zero. The finding of insignificant returns for buyers is at odds with the findings of several studies (for example Rosenfeld [1984], Jain [1985], Hite, Owers and Rogers [1987], Sicherman and Pettway [1992] and John and Ofek [1995]). However, this can be explained by the inclusion of only large transactions in this data set. Zaima and Hearth [1985] find that the gains to a sell-off become more one-sided in favour of the seller as the size of the transaction increases.

Looking now at the breakdown of average abnormal returns by use of proceeds, one notes that mean seller abnormal returns are significantly positive for all uses. While the mean abnormal return is the highest (2.2%) when the firm re-invests, and second highest when repaying debt (2.0%), the test results in Panel B reveal that the differences between the three classes' means are insignificant[10]. The median abnormal returns for sellers show that only those sellers re-investing the proceeds earn significantly positive median returns. The other classes' medians are insignificant. However, as Panel B shows the differences in medians to be insignificant, this is only weak evidence that those firms which re-invest the proceeds of an asset sale have larger stock market reactions[11].

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[10] Note that the significantly positive mean abnormal return for those firms with an unknown use of proceeds is heavily influenced by one firm with a very large abnormal return of 39%.

[11] While the evidence in Table III for re-investing firms having more gains is weak, it at least does not suffer from the Lang, Poulsen, Stulz critique of the Mayers and Singh findings. Mayers and Singh find large market reactions to asset sale programs where the proceeds will be used to repurchase stock, smaller positive reactions to programs whose proceeds will be re-invested, and negative reactions when debt is to be repaid with the proceeds. Lang et al. point out that these findings are consistent with the findings for repurchases of stock, investment in the firm and repayment of debt independent of any asset sale program. The results presented here are not subject to the same criticism as sellers receive insignificant negative median abnormal returns when repurchasing stock. If the effect was due simply to the use of proceeds itself and independent of its association with an asset sale, then one would expect this to be positive and greater than in the other classes.

Firms which purchase assets from firms re-investing or repaying debt earn insignificant abnormal returns (in both mean and median). However, buyers purchasing assets from firms which repurchase stock have abnormal returns which are significantly negative in the mean (-1.3%) and the median (-1.7%). Given that seller abnormal returns are negative (although insignificant) in the median for this sub-sample, it seems unlikely that this is a result of the selling firm benefiting from a wealth transfer from the buying firm. An explanation for this result can be found by looking at the root cause of many of the sell-offs in the repurchase sample, namely, the threat of a hostile takeover of the divesting firm.

In Chapter 3 of this thesis, it was shown that when the selling firm has been under the threat of takeover, buying firms earn significantly negative average abnormal returns, while sellers' returns are not significantly different from those not under a takeover threat. This would explain the observed negative returns for buyers in the repurchase stock category if there is, in fact, a correlation between takeover threats on the firm and the use of asset sale proceeds to repurchase stock. The WSJ Index for the year prior to the initial announcement was examined for each of the divesting firms in the sample in order to determine if there was a takeover offer made for the firm or if rumours about the firm being "in play" were mentioned. Firms for which one of these was true were classified as "threatened" sellers. There were 21 cases of a threat on the seller within the year prior to the asset sale.

This represents 15.1% of the entire sample of 139. For those sellers using the proceeds to repurchase stock, there were 8 threatened sellers out of a sample of 20 (40%)[12]. It seems that the firms repurchasing their own stock are made up of a disproportionate number of firms facing a takeover threat. Hence, asset sales appear to be used as takeover defenses in at least some cases through their use to fund repurchases of stock by the target. The mean abnormal return for buyers purchasing from firms which are under a threat and repurchase their stock is -3.352%, significant at a 5% level. The mean abnormal return for buyers purchasing assets from firms which are not under a takeover threat and repurchase their stock is an insignificant 0.058%. Thus, it seems that the observed average losses for buyers in the repurchase category arise because repurchases tend to be symptomatic of a takeover threat on the selling firm.

The findings in Table 4-3 seem to contradict previous research in that there are no significant differences in seller abnormal returns across different stated uses of proceeds. The findings are especially at odds with the Lang, Poulsen, Stulz results because firms retaining the proceeds of the sale are the only firms whose median gain is significantly positive. Lang et al. find that firms retaining proceeds receive significantly lower abnormal returns than do firms which pay the proceeds out of the firm. One possible explanation for the difference between the results here and those of previous research is that some of the asset sales in this sample may be part of an on-going divestiture program on the part of the selling firm. If this is true, then the market may have already discounted much of the effect of the asset sale. If the proceeds of the other sales in the program have been used for the same purpose the market will have taken this into account as well and any difference between the uses of proceeds may disappear.

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[12] The difference in the proportion of firms under a takeover threat between the sub-sample repurchasing and sub-sample of firms with other uses is significant at 1%.

In order to account for the possibility that the market has anticipated asset sales that are part of an on-going program, the WSJ Index was searched for the year prior to the initial announcement in order to determine if other sales had been announced or if the selling firm had formally announced a divestiture program (which would include the asset sale in the sample). If the firm made two or more other sales in the previous year, it was classified as being in a program.

The analysis in Table 4-3 was repeated using only those transactions for which the seller was *not* classified as being in a program (there are 95 transactions in this sample). The results are presented in Table 4-4. The results for the buyer abnormal returns are the same as those on the entire sample; all are insignificant except for those firms purchasing assets from sellers which use the proceeds to repurchase stock, which are significantly negative. For sellers which repurchase stock, the median gain is still negative and insignificant although the mean is also now insignificant. The median return to sellers retaining the proceeds is a significant 1.823% and the median return to sellers repaying debt is 0.139% (insignificant). The difference between these is significant. Thus, it seems that sellers repaying debt receive significantly lower median abnormal returns than do those sellers which use the proceeds to re-invest in the firm. This finding is consistent with creditors pressuring firms to sell assets in order to reduce their degree of leverage and these firms receiving lower returns on announcement of the sale. However, there is no significant difference between the abnormal returns of the buyers in the re-invest sample and the repay debt sample. Abnormal returns are, in fact, lower (both in mean and median, although the difference is insignificant) for buyers when the seller repays debt than for buyers when the seller re-invests. If creditor pressure on selling firms leads those firms to sell assets quickly for low prices, one would expect that the buyer would receive the benefit and therefore buyers would have higher abnormal returns when the seller was repaying debt. This is not the case. There is no evidence that buyers are able to benefit from creditor pressure on the sellers of corporate assets.

There are three possible problems with the above conclusion: there may be a difference in the size of assets that are sold by firms repaying debt and those retaining the proceeds, it is possible that the difference in seller abnormal returns between these two uses of proceeds is due to the observed difference in the financial characteristics of the firms rather than the use of proceeds itself, and the insignificant results for buyers may be due to the buyer being significantly larger than the seller.

It is well known that abnormal returns to divesting firms are positively associated with the size of the asset being divested. If firms retaining proceeds are making larger average sales than those firms repaying debt then the difference in gains between the two samples may not be due to the use of proceeds. Table 4-5 presents the average price and average percentage of the market value of common stock that this price represents for the repay debt and re-invest samples. Note first, from the percentage of market value of common stock figures, that these are indeed large assets being sold. More important, however, is the fact that there is no significant difference in the size of the average sale between the two samples.

Since the selling firms repaying debt tend to be more highly leveraged and have poorer prior performance than firms retaining proceeds, it is necessary to check if this difference explains the observed difference in abnormal returns. The abnormal returns for all firms were regressed on four variables: the interest coverage ratio, the return on assets, the long term debt to book assets ratio, and the price paid for the asset as a percentage of the market value of common equity. The residuals from this regression for those firms repaying debt and those firms re-investing in the firm were then compared. Table 4-6 shows that the median residuals from this regression are significantly higher (at 10% in a one-tail test[13]) for the re-invest sample than for the repay debt sample. Note that the residuals are significantly negative in the median for the repay debt sample, indicating that their reaction to the announcement of the asset sale is worse than would be predicted by their financial condition and the size of the divestiture. It seems, then, that the fact that firms repaying debt have lower abnormal returns is not due entirely to their financial condition, nor to the size of the sales they complete.

Finally, the average size of the transactions with respect to the buying firm was examined to see if this could explain the lack of significant results for buyers. The initial sample was restricted to sales worth ten percent or more of the market equity of the selling firm. There was no such constraint on the size of the transaction with respect to the buying firm. Across transactions for which the seller was not in a program of sales, the mean price as a percentage of the buyer's market equity is 25.2% (median 12.4%). This compares to a mean price as a percentage of the seller's market equity of 70.3% (median 32.6%)[14]. While the transactions are large with respect to the buyer, they are substantially less significant to the buyer than to the seller. This raises the possibility that the results may be driven by sales in which large buying firms transact with much smaller divesting firms. Because the asset is small with respect to the buyer, the abnormal return will generally be small and hence the tests may not be powerful enough to pick up any differences across uses of proceeds.

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[13] A one-tail test is used because the prior hypothesis, given the previous findings, is that the repay debt firms perform worse.

[14] Over all transactions, including those where the seller is in a program of sales, the mean price as a proportion of buyer's equity is 25.2% (median 11.4%) and of seller's equity is 66.3% (median 33.1%).

In order to address this possibility, the sample was restricted to those sales for which the seller was not in a program of sales and for which the price was greater than ten percent of the market equity of the buying firm[15,16]. This sample contained 49 transactions (23 repay debt, 8 repurchase, 15 re-invest and 12 unknown).

Table 4-7 contains the results for the buying firms from this sample. Note that, as before, there are no significant differences in abnormal returns between buyers in the repay debt and re-invest categories. Thus, the previous conclusions are not a function of transaction size relative to the buyer. Also note, however, that the mean CAR for buying firms in the re-invest category is significantly positive while all other categories are insignificant or significantly negative. Hence, there does exist weak evidence that buying firms' abnormal returns vary across the use of proceeds and are higher when the selling firm re-invests in itself. This finding serves to strengthen the previous conclusions concerning creditor pressure. Creditor pressure (if repaying debt is indicative of this) on the divesting firm leads to asset sales that are less valuable to *both* the seller and the buyer. Obviously, buyers are

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[15] Of course, the small sample size means that the tests conducted on the constrained sample will not be as powerful as those on the full sample.

[16] A sample of transactions in which the price as a proportion of buyer's equity and as a proportion of seller's equity were within 10% of each other was also tested. There was no significant difference between buying firms in the repay debt and the re-invest categories.

not benefiting from this pressure. The evidence is consistent with pressure manifesting itself through firms being forced to sell assets that they otherwise would not, presumably because there are fewer gains to trade in these assets. The pressure to sell does not affect the negotiating power of the selling firm, but rather the timing of its decision and, possibly, the type of asset sold. Both parties to the transaction receiving lower gains would be consistent with this scenario in which creditor pressure leads to divestitures with fewer total available gains that are divided between the two firms.

IV - Conclusions

The main conclusion of the findings presented here is that, although creditors may pressure firms to sell assets, buyers do not, on average, gain from this pressure through negotiation of lower prices. This is evidenced by the fact that the median abnormal returns for firms selling assets and using the proceeds to repay debt are significantly lower than for those firms retaining the proceeds, but the average abnormal returns to firms buying the assets are not significantly different across different uses of proceeds by the seller.

The findings reported here are similar to those reported by Sicherman and Pettway [1992]. Sicherman and Pettway study a sample of buying and selling firms and find that selling firms which have suffered a credit downgrade within the two previous years receive significantly lower abnormal returns, while the abnormal returns to buyers are unaffected by a downgrade to the seller. This is consistent with the conclusions presented here regarding the effect of creditor pressure. However, the interpretation that Sicherman and Pettway put on their results is somewhat different. They take a credit downgrade as a proxy for poor financial health on the part of the seller and hypothesize that this will lead to less bargaining power in negotiations. It has been shown here (see Table 4-6) that it is not the financial health of the firm that is the cause of lower abnormal returns, but pressure from creditors. Poor financial health and creditor pressure to repay debt are not substitutes for one another. As well, Sicherman and Pettway fail to draw the connection between the lower returns for sellers and the lack of significant effect on buyers as it relates to buying firms' inability to negotiate lower prices from pressured sellers.

Several hypotheses regarding the variation in average abnormal returns for divesting firms using the proceeds of a sell-off differently were presented. Although no firm conclusions regarding which are the "true" causes can be made, some can be ruled out by the results:

1) Agency Costs:

a) The possibility of leverage reductions through asset sales raising agency costs is still possible, although one would expect that firms increasing leverage through the repurchase of stock would lower agency costs. This does not seem to be the case as those firms repurchasing stock receive lower abnormal returns.

b) There is no evidence of the market discounting retained proceeds because of potential agency problems as per Lang, Poulsen and Stulz.

2) Signaling:

a) A reduction in leverage through the use of the proceeds of an asset sale may signal bad future prospects for the firm or a problem previously unknown to the market. However, given the low interest coverage ratios of firms repaying debt it is unlikely that the market was unaware of any problem before the sale.

b) Variation in returns across use of proceeds does not seem to be due to repurchases of stock signaling undervalued equity as the firms repurchasing experience lower stock price gains.

c) It is possible that retaining the proceeds of an asset sale is a good signal to equity markets about the investment opportunity set of the firm.

d) Retaining the proceeds of an asset sale does not seem to signal lower future cashflows.

3) Financial Distress:

a) The avoidance of financial distress leading to higher returns does not seem to fit the data as firms repaying debt receive lower average returns.

b) Finally, it is possible that creditors bring pressure to bear on firms selling assets, but this pressure does not seem to manifest itself in fire sale prices (at least for the average firm).

Overall, the findings indicate that, while creditor pressure may have a detrimental impact on some divesting firms, the average buyer should not count on benefiting from this pressure. The evidence is consistent with pressure leading divesting firms to sell assets which they otherwise would not choose to divest, but at prices that reflect their fair value given market conditions. It seems that, while pressure may be able to force a sale of assets that the divesting firm would rather not engage in, once the decision to divest is taken the influence of creditor pressure stops at the negotiating room door. Ergo, when dealing with divesting firms under pressure from creditors, buyers should not expect to be able to buy superior assets at rock-bottom prices.

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Table 4-1. Financial Characteristics of Firms in Sample

This table contains the financial characteristics of firms involved in large asset sales. Median values are given with means in parentheses. Statistics are based on a sample of 138 buying firms and 135 selling firms from the total sample of 139 as one buyer and four sellers have missing financial data. Interest coverage for buyers is calculated based on 135 firms as 3 buyers have zero reported interest expense. Income before extraordinary items and the market value of common stock are given in millions. The fourth column contains two tail p-values for tests of the null hypothesis of equal medians and means (in parentheses). Tests are conducted using Wilcoxon Rank Sum tests for medians and standard t-tests for means.

	Buyers	Sellers	Test for Difference
Book Assets	1709.907	1058.412	0.0105
	(6943.695)	(2984.497)	(0.0083)
Market Value of Common	1220	304	0.0001
	(3300)	(794)	(0.0001)
Income before Extraordinary	92.618	14.900	0.0001
	(328.362)	(51.062)	(0.0001)
Interest Coverage	4.028	2.255	0.0001
	(10.475)	(2.458)	(0.0096)
Income/Assets	0.051	0.025	0.0001
	(0.057)	(0.013)	(0.0000)
LT Debt / Book Assets	0.211	0.245	0.0008
	(0.224)	(0.286)	(0.0012)

Table 4-2. Financial Characteristics by Use of Proceeds

This table contains financial characteristics for firms in different use of proceeds subsamples. The first three columns present median values with means in parentheses. The last three columns present two-tail p-values from Wilcoxon rank sum tests on equality of medians across uses and from t-tests on equality of means (in parentheses). Firms for which the use of proceeds could not be determined were excluded, leaving a total sample of 116 firms. Financial statistics exclude four sellers and one buyer which had missing financial data. Interest Coverage for buyers excludes 2 firms with zero interest expense.

Panel A. Sellers

	Re-invest	Repurchase	Repay Debt	p-value: Re-invest vs. Repurchase	p-value: Re-invest vs. Repay Debt	p-value: Repurchase vs. Repay Debt
Book Assets	1151.349	1119.674	904.343	0.2375	0.5458	0.2330
	(3254.855)	(3287.935)	(2144.876)	(0.9835)	(0.3722)	(0.3135)
Market Value of Common	283.232	760.989	296.946	0.0387	0.9746	0.0191
	(732.715)	(1358.248)	(780.660)	(0.1075)	(0.8039)	(0.1296)
Income bef. Extra.	21.858	64.716	9.225	0.0335	0.0954	0.0006
	(22.380)	(181.311)	(25.749)	(0.0812)	(0.9448)	(0.0023)
Interest Coverage	2.769	3.957	1.634	0.3153	0.0118	0.0043
	(3.186)	(3.724)	(1.833)	(0.5523)	(0.0236)	(0.0145)
Inc./Assets	0.037	0.046	0.013	0.2681	0.0092	0.0008
	(0.022)	(0.044)	(0.004)	(0.1022)	(0.1407)	(0.0044)
Debt/Assets	0.207	0.207	0.281	0.2203	0.0037	0.0001
	(0.243)	(0.188)	(0.330)	(0.0241)	(0.0040)	(0.0001)

Panel B. Buyers

	Re-invest	Repurchase	Repay Debt	p-value: Re-invest vs. Repurchase	p-value: Re-invest vs. Repay Debt	p-value: Repurchase vs. Repay Debt
Book Assets	3057.739	2319.187	1513.961	0.7168	0.1007	0.3021
	(8594.169)	(6163.251)	(4223.358)	(0.4938)	(0.1247)	(0.3563)
Market Value of Common	1900.180	1336.520	1285.010	0.7064	0.3909	0.7155
	(3778.638)	(2465.862)	(3655.229)	(0.1457)	(0.9108)	(0.2405)
Income bef. Extra.	178.017	61.776	102.953	0.1804	0.0707	0.7619
	(478.100)	(296.741)	(248.824)	(0.3962)	(0.0996)	(0.7174)
Interest Coverage	4.182	4.028	4.167	0.3981	0.8555	0.4121
	(6.840)	(6.725)	(13.078)	(0.9790)	(0.2722)	(0.3550)
Inc./Assets	0.057	0.039	0.053	0.0328	0.4189	0.0849
	(0.069)	(0.040)	(0.058)	(0.0499)	(0.3262)	(0.2647)
Debt/Assets	0.207	0.191	0.217	0.6302	0.4749	0.3438

(0.206)	(0.192)	(0.235)	(0.6908)	(0.3318)	(0.2883)

Table 4-3. Abnormal Returns Across Seller's Use of Proceeds

This table contains cumulative abnormal returns (CAR's) for buying and selling firms in different use of proceeds subsamples and tests for the significance of differences between the subsamples. In Panel A, median CAR's are reported with mean CAR's in parentheses (all figures are in percentage form). Tests of significant difference from zero are done with a Wilcoxon sign rank test on the medians and t-tests on the means. * indicates significance at a 10% level, ** indicates significance at a 5% level and *** indicates significance at a 1% level (all in two tail tests). Panel B contains p-values (two tail) for tests of differences between medians (p-values for means in parentheses) over different uses of proceeds. Differences in medians are tested using Wilcoxon rank sum tests and differences in means are tested using standard t-tests.

Panel A. Cumulative Abnormal Returns

	Buyers	Sellers
Total Sample	-0.229	0.775***
(N=139)	(0.054)	(2.192***)
Seller Re-invests	0.209	0.945*
(N=46)	(0.382)	(2.218***)
Seller Repurchases Stock	-1.671*	-0.151
(N=20)	(-1.266**)	(1.728**)
Seller Repays Debt	-0.229	0.455
(N=73)	(0.100)	(1.982***)
Unknown Use	-0.266	0.449
(N=23)	(0.286)	(2.454*)

Panel B. p-values for Tests of Differences

	Buyers	Sellers
Repay Debt vs. Repurchase	0.1593	0.8188
	(0.2485)	(0.9032)
Repay Debt vs. Re-invest	0.6763	0.5249
	(0.7192)	(0.8792)
Repurchase vs. Re-invest	0.1117	0.8017
	(0.2330)	(0.7959)

Table 4-4. Abnormal Returns Across Seller's Use of Proceeds when Seller not in Program
This table reports cumulative abnormal returns for firms when the seller is classified as not being in a program of divestitures and tests for significance of the differences between use of proceeds subsamples. In Panel A, median CAR's are reported with mean CAR's in parentheses (all figures are in percentage form). Tests of significant difference from zero are done with a Wilcoxon sign rank test on the medians and t-tests on the means. * indicates significance at a 10% level, ** indicates significance at a 5% level and *** indicates significance at a 1% level (all in two tail tests). Panel B contains p-values (two tail) for tests of differences between medians (p-values for means in parentheses) over different uses of proceeds when the seller is not in a program. Differences in medians are tested using Wilcoxon rank sum tests and differences in means are tested using standard t-tests.

Panel A. Cumulative Abnormal Returns

	Buyers	Sellers
Total Sample	-0.226	0.776**
(N=95)	(-0.100)	(2.453***)
Seller Re-invests	0.539	1.823**
(N=34)	(0.554)	(3.434***)
Seller Repurchases Stock	-1.770*	-0.105
(N=14)	(-2.304**)	(1.277)
Seller Repays Debt	-0.238	0.139
(N=43)	(0.042)	(1.878***)
Unknown Use	-0.226	-0.160
(N=21)	(0.422)	(2.510*)

Panel B. p-values for Tests of Differences

	Buyers	Sellers
Repay Debt vs. Repurchase	0.1850	0.7039
	(0.1065)	(0.8238)
Repay Debt vs. Re-invest	0.6044	0.0821
	(0.6100)	(0.4426)
Repurchase vs. Re-invest	0.0807	0.4013
	(0.0462)	(0.3688)

Table 4-5. Prices and Prices as a Percentage of the Market Value of the Seller's Common Stock
This table contains prices paid in transactions for which the seller used the proceeds to repay debt or to re-invest in the firm. Prices are in millions. P-values reported are two tail from standard t-tests on the means and Wilcoxon rank sum tests on the medians. Sample is of 73 firms repaying debt and 46 firms re-investing proceeds.

	Repay Debt	p-value for difference between samples	Re-invest
Mean Price	220.0	0.8956	213.9
Median Price	115.0	0.8293	115.0
Mean Percent of Mkt.	0.617	0.5675	0.539
Median Percent of Mkt.	0.342	0.7913	0.302

Table 4-6. Residuals from Regression on Financial Ratios and Asset Size

This table contains the average residuals obtained from the regression:

CAR = 0.0097 + 0.1503 (ROA) + 0.0391 (Debt/Assets) - 0.0043 (Int. Cov.) + 0.127 (percent of mkt.)

p-values are one-tail from standard t-tests on the means and Wilcoxon rank sum tests on the medians. * indicates that a Wilcoxon sign rank test reveals the median residual is significantly different from zero at a 10% level in a two tail test.

	Repay Debt	p-value for difference between samples	Re-invest
Mean Residual	-0.00604	0.1797	0.007453
Median Residual	-0.01148*	0.0972	-0.00563

Table 4-7. Buyer Abnormal Returns Across Seller's Use of Proceeds when the Transaction is Large with Respect to the Buyer and the Seller is not in Program

This table reports cumulative abnormal returns for buying firms when the transaction price is greater than 10% of the buying firm's market value of equity and the seller is classified as not being in a program of divestitures. In Panel A, median CAR's are reported with mean CAR's in parentheses (all figures are in percentage form). Tests of significant difference from zero are done with a Wilcoxon sign rank test on the medians and t-tests on the means. * indicates significance at a 10% level, ** indicates significance at a 5% level and *** indicates significance at a 1% level (all in two tail tests). Panel B contains the p-values for tests of significant differences in CAR's between different subsamples.

Panel A. Cumulative Abnormal Returns

	Buyer Abnormal Return
Total Sample	-0.997
(N=49)	(0.039)
Seller Re-invests	0.974
(N=15)	(2.057***)
Seller Repurchases Stock	-2.375
(N=8)	(-3.503**)
Seller Repays Debt	-1.082
(N=23)	(0.397)
Unknown Use	-0.075
(N=12)	(0.239)

Panel B. Tests for Differences

	p-value for Rank Sum test of medians	p-value for t-test of means
Repay Debt vs. Repurchase	0.1755	0.1201
Repay Debt vs. Re-invest	0.3546	0.1814
Repurchase vs. Re-invest	0.0419	0.0274

Chapter 5

General Discussion and Conclusions

It is well known that there are many exogenous factors that may force changes on a firm. The research in this thesis, however, has dealt with changes that are undertaken voluntarily by the firm. Changes in both the management structure and in the asset structure of the firm were examined and some interesting conclusions reached.

Previous empirical research on the role of the Board of Directors has often assumed that if the Board fails to replace a manager that is deemed to be underperforming, then the Board is either shirking or is not acting in the interests of shareholders. The validity of this assumption is important because evidence showing the Board is not performing in its role as guardian of shareholder interests brings into question the efficacy of the corporate governance structure of the modern corporation. The model developed here shows that a Board of Directors may not choose to replace a below average manager even if they know him/her to be of below average ability. While the model has not yet been empirically tested, it is nonetheless important for future empirical researchers to keep the result in mind when interpreting data and drawing conclusions.

Another type of voluntary change that a firm may enter into is a change in the structure of its assets. Here, changes conducted through a sale of assets to anther firm were examined. The gains to the transaction for both the buying firm and the selling firm were examined for each asset sale. Using this type of sample allowed for the drawing of some interesting conclusions. In particular, it seems that asset sales following a takeover tend to have fewer total gains for the firms involved, that sales of assets to firms with tighter capital constraints are associated with larger total gains, that poor performance may act as a disciplining device insofar as bargaining in asset sale transactions is concerned, and that creditors may exhibit influence on asset sales but their influence does not allow buying firms to tale advantage of pressured sellers.

Perhaps the most important conclusion on asset sales is that there is a distinct benefit to observing the gains and firm characteristics on both sides of a transaction. Many of the results in this thesis would not have been possible to observe without this methodology.

In conclusion, firms are constantly evolving and undergoing (sometimes radical) change. It is important for academics to try and understand the nature of these changes both through empirical observation and theoretical modeling. In this way, we can better understand both what the effects of these changes are as well as why they occur.

Appendix

Derivation of equation (8a) in Chapter 2:

The Board will be indifferent to replacing the manager if:

$$V\left(E^{*}[\tilde{a}]-\varepsilon\right)=E^{*}\left[V(\tilde{a})\right]-c^{*}+k-d \tag{A1}$$

Consider a second order Taylor expansion of $V(\tilde{a})$ at $E^{*}[\tilde{a}]$:

$$V(\tilde{a})\approx V\left(E^{*}[\tilde{a}]\right)+V'\left(E^{*}[\tilde{a}]\right)\left(\tilde{a}-E^{*}[\tilde{a}]\right)+\tfrac{1}{2}V''\left(E^{*}[\tilde{a}]\right)\left(\tilde{a}-E^{*}[\tilde{a}]\right)^{2} \tag{A2}$$

Taking the expectation of (A2):

$$E^{*}\left[V(\tilde{a})\right]=V\left(E^{*}[\tilde{a}]\right)+\frac{\sigma_{a}^{2}}{2}V''\left(E^{*}[\tilde{a}]\right) \tag{A3}$$

Now, take a first order Taylor expansion of $V(E[\tilde{a}]-\varepsilon)$ at $E^{*}[\tilde{a}]$:

$$V\left(E^{*}[\tilde{a}]-\varepsilon\right)=V\left(E^{*}[\tilde{a}]\right)+V'\left(E^{*}[\tilde{a}]\right)(-\varepsilon) \tag{A4}$$

Combining A3, A4 and A1 and then solving yields:

$$\varepsilon=-\frac{1}{2}\sigma_{a}^{2}\frac{V''\left(E^{*}[\tilde{a}]\right)}{V'\left(E^{*}[\tilde{a}]\right)}+\frac{c^{*}-k+d}{V'\left(E^{*}[\tilde{a}]\right)}$$

Q.E.D.